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ABSTRACT

This volume is one of several which describe the characteristics, quality, and costs of services to severely handicapped children and youth in 100 providers across the nation. This volume includes the development of data collection instruments and a mail survey of potential providers of services to severely handicapped children and youth. The survey was conducted for the purpose of creating a pool of providers from which 100 facilities could be selected for site visits. From the 1,550 respondents to the mail survey, 100 providers were selected who serve severely handicapped clients aged 21 or under. This selection was accomplished by grouping the respondents into eight sampling categories according to the number of clients they served. Providers were also selected based upon whether they served a majority of clients who are either severely mentally retarded, severely emotionally disturbed, severely multiply handicapped, or deaf-blind. Some providers were selected who served a mixed severely handicapped population. The volume contains discussions of the procedures and methodology used in conducting the study; characteristics of the 100 providers; client observations; costs of services; the relationship of expenditure and quality; a summary of major findings; and specific policy questions and suggestions based on the present data base and/or the expertise of project staff. (RC)

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ASSESSMENT OF SELECTED RESOURCES FOR SEVERELY HANDICAPPED CHILDREN AND YOUTH

Volume 3: Data Analysis and Results

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Abt Associates Inc.
55 Wheeler Street
Cambridge, Massachusetts

AAI Report No. 7549

March, 1976

Contract Manager	Quality Control Reviewer	Management Reviewer

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The project directors of this study are deeply indebted to many, many people for their cooperation and assistance in all phases of the project. First and foremost, we wish to thank the directors, staff and clients of the 100 providers included in the study for the warm, open reception they offered us: we continue to be extremely impressed by the amount of effort directors and staff devoted to responding to interviews and to the conduct of observations by Abt Associates field personnel, as well as by their genuine interest in receiving feedback and suggestions for bettering their services to severely handicapped clients.* To the clients at the 100 providers we wish to extend our special thanks; it is to these children and youth that we dedicate these reports.

A number of providers not included in the study were kind enough to allow us to pretest field instruments and procedures in the early phase of the project. The staff of the Belchertown State School, Belchertown, Massachusetts; the West Springfield Developmental Day Care Center, West Springfield, Massachusetts; the Fernald State School, Waltham, Massachusetts; and the Pacific State Hospital, Pomona, California deserve special thanks for their timely feedback at a most critical juncture in the study. The staff of the Walker Home for Children in Needham, Massachusetts, particularly Charlie Noble, Al Treischman and Krikor Derhohannesian, were enormously helpful in the refinement of instruments as well as in providing videotape equipment for use in the training of observers. Harriet Klebanoff of the Media Resource Center also supplied a number of very useful films for the same purpose. M. Michael Klaber of the University of Hartford was extremely generous in allowing us to use a revised version of an observation instrument which he developed for

*Note: Because providers were assured complete anonymity in the study, the names of the 100 providers are not linked to any data and, hence, do not appear in any of the reports. However, with the permission of each director, the names of 99 (one provider declined to be listed) of the providers included in the study are listed alphabetically on page vii following.

his study entitled, Retardates in Residence: A Study of Institutions (1967). For Dr. Klaber's willingness to share the instrument with us, we are most grateful.

The Abt Associates field supervisors and observers, who visited the 100 sites and collected the data reported herein, worked tirelessly and effectively even under difficult field conditions. We wish to thank Joel Braun, Mickey Conte, David Danforth, John Doucette, Vivian Eichler, Barbara Epstein, Janet Fentin, Gail Fenton, Annette Ferstenberg, Margo Giroux, Shirley Giurlani, Barbara Goodman, Pat Huff, Cheri Hurst, Betty May Irwin, Muriel Kendrix, Wendell Knox, Jim Leath, Connie Long, Sidney (Bones) Mason, Margie O'Farrell, Marj Scarlett, Mona Stein, Lorrie Stuart, Key Sweeney, Day Thomson, Donna Warner and Bonnie Wilpon. Without the efforts of these staff members, a report such as this could not possibly have been written.

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Donald Muse, Ph.D., Project Director
(1975-1976)

Patricia Cook, Project Director
(1973-1975)

Elinor Gollay, Deputy Project Director
(1973-1976)

Listed alphabetically below are 99 of the 100 providers visited by Abt Associates field personnel in gathering data for this study.

Alabama Institute for Deaf and Blind
Talladega, Alabama

A. G. Bell School for the Deaf
Cleveland, Ohio

American Institute for Mental Studies
The Training School Unit
Vineland, New Jersey

Arizona State School for the Deaf and Blind
Tucson, Arizona

Arkansas Enterprise for the Blind
Little Rock, Arkansas

Bide a Wee Home
El Cajon, California

Blind Children's Resource Center
Portland, Maine

Brookline Public Schools
Brookline, Massachusetts

Callier Center for Communication Disorders
Dallas, Texas

Cedar Grove Children's Home
Angwin, California

Center for Multiple-Handicapped Children
New York, New York

Cerebral Palsy and Orthopedic School
Greensboro, North Carolina

Cerebral Palsy Foundation of Southern Arizona, Inc.
Tucson, Arizona

The Children's Village
Dobbs Ferry, New York

Cincinnati Center for Developmental Disorders, Autistic Program
Cincinnati, Ohio

Civitan Daycare Center
Tampa, Florida

Clear View School
Dobbs Ferry, New York

Community Services for Exceptional Citizens, Inc.
Oak Ridge, Tennessee

Cooperative School for Handicapped Children
Alexandria, Virginia

Corvallis School District 509J
Corvallis, Oregon

Countryside Center for the Handicapped
Barrington, Illinois

Dean School, Inc.
Fort Worth, Texas

DeKalb Training Center for the Mentally Retarded
Scottdale, Georgia

Developmental Center of the Woodstock Learning Clinic
Woodstock, Vermont

Dr. U. E. Zambarano Memorial Hospital
Wallum Lake, Rhode Island

Eastern Nebraska Community Office of Retardation (ENCOR)
Omaha, Nebraska

East San Gabriel Valley School for Multi-Handicapped Children
Glendora, California

Elkhart County Association for the Retarded, Inc.
Bristol, Indiana

Episcopal Church Home for Children
York, South Carolina

Ernest L. Herrman School
Lowell, Massachusetts

Fairview Hospital and Training Center
Salem, Oregon

Fulton County West Training Center of the Retarded
Atlanta, Georgia

Glenwood State Hospital School
Glenwood, Iowa

Great Bay Center
Newington, New Hampshire

The Haven School, Inc.
Miami, Florida

Henry Ittleson Center for Child Research
Riverdale, New York

Hillsborough Association for Retarded Citizens
Tampa, Florida

Hughen School for Crippled Children
Port Arthur, Texas

Idaho State School for the Deaf and the Blind
Gooding, Idaho

Infant, Toddler and Preschool Research and Intervention Project
Nashville, Tennessee

J. A. Johnson Crib Care Home
Lee's Summit, Missouri

Kalevala Tutoring School, Inc.
Philmont, New York

League School of Boston
Boston, Massachusetts

Les Passees Rehabilitation Center, Children's Division
Memphis, Tennessee

Little Angels Nursing Home
Elgin, Illinois

Logansport State Hospital
Logansport, Indiana

Lovegrove Elementary School, DuValle County
Jacksonville, Florida

Marshall-Starke Development Center, Inc.
Plymouth, Indiana

May Institute for Autistic Children, Inc.
Chatham, Massachusetts

McKeesport Preschool for Exceptional Children
McKeesport, Pennsylvania

Mental Health Institute
Mt. Pleasant, Iowa

Michele's Little Ones
Santa Rosa, California

Michigan School for the Blind
Lansing, Michigan

Montanari Residential Treatment Center
Hialeah, Florida

Moody School, University of Texas Medical Branch
Galveston, Texas

Mount Carmel Guild Child Study Center
Ridgefield Park, New Jersey

Multiple Handicap Project, Kennedy Experimental School
Peabody College
Nashville, Tennessee

Nanon Wood Achievement School
Effingham, Illinois

Nelson House
Spruce Creek, Pennsylvania

The New York Institute for the Education of the Blind
Bronx, New York

North Dakota School for the Deaf
Devils Lake, North Dakota

North Dakota State School for the Blind
Grand Forks, North Dakota

Northville Residential Training Center
Northville, Michigan

O'Berry Center
Goldsboro, North Carolina

Oregon School for the Blind
Salem, Oregon

Our Lady of Providence
Northville, Michigan

The Parry Center for Children
Portland, Oregon

Parsons State Hospital and Training Center
Parsons, Kansas

Plymouth Center for Human Development
Northville, Michigan

Pre-Schooler's Workshop
Garden City, New York

Providence Child Center
Portland, Oregon

Ridge Area Association for Retarded Citizens
Sebring, Florida

Roger Walton Development Center
Stockton, California

Ronoh School for Disturbed Children
Richmond, California

St. Cloud Children's Home
St. Cloud, Minnesota

St. Louis State School and Hospital
St. Louis, Missouri

San Diego Children's Home Association
San Diego, California

Santa Barbara County Autism Project
Santa Barbara, California

Seaside Regional Center
Waterford, Connecticut

Southeast Louisiana Hospital
Mandeville, Louisiana

Spaulding Youth Center
Tilton, New Hampshire

State Home and Training School
Wheat Ridge, Colorado

State School for Retarded
Fulton, Missouri

Sunland at Tallahassee
Tallahassee, Florida

Sunland Training Center
Gainesville, Florida

Traverse City State Hospital
Traverse City, Michigan

Travis State School
Austin, Texas

United Cerebral Palsy Association of Fairfield County, Inc.
Bridgeport, Connecticut

United Cerebral Palsy of Denver, Inc.
Denver, Colorado

University of Alabama
University, Alabama

University Affiliated Facility
University of Kansas Medical Center
Kansas City, Kansas

Day Treatment Unit, Division of Child Psychiatry
University of Washington
Seattle, Washington

Valley of the Sun School
Phoenix, Arizona

Walker Home for Children, Inc.
Needham, Massachusetts

The Wallace Village for Children
Broomfield, Colorado

West Virginia Schools of the Deaf and Blind
Romney, West Virginia

William W. Fox Children's Center
Dwight, Illinois

Wisconsin Child Center
Sparta, Wisconsin

Youth Treatment Unit, Vermont State Hospital
Waterbury, Vermont

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1.0 INTRODUCTION

In July, 1973, Abt Associates Inc. was awarded a contract by the Office of Planning, Budgeting and Evaluation (OPBE) of the United States Office of Education to conduct a nationwide "Assessment of Selected Resources for Severely Handicapped Children and Youth" (Contract No. OEC-0-73-7030). The present volume is one of a five-volume series produced over the course of the project to describe the characteristics, quality and costs of services to severely handicapped children and youth in 100 providers across the nation.

For the purposes of this study, "severely handicapped children and youth" were functionally defined as those persons aged 21 and under who are either mentally retarded, emotionally disturbed, deaf-blind or multiply-handicapped and who exhibit two or more of the following behaviors with a high degree of regularity:

- Self-mutilation behaviors such as head banging, body scratching, hair pulling, etc. which may result in danger to oneself;
- Ritualistic behaviors such as rocking, pacing, autistic-like behaviors, etc. which do not involve danger to oneself;
- Hyperactive-aggressive behaviors which are dangerous to others;
- Self-stimulation behaviors such as masturbation, stroking, patting, etc. for a total of more than 1 hour of a waking day;
- Failure to attend to even the most pronounced social stimuli, including failure to respond to invitations from peers or adults, or loss of contact with reality;
- Lack of self-care skills such as toilet training, self-feeding, self-dressing and grooming, etc.;
- Lack of physical mobility including confinement to bed, inability to find one's way around the institution or facility, etc.

The project was conducted in three phases:

Phase I consisted of an extensive review of the literature for the purpose of developing an annotated bibliography and state-of-the-art paper on research and services for severely handicapped children and youth. Volumes 1 and 2 of the series were developed during this phase of the study.

Phase II included the development of data collection instruments for use during the third phase and a mail survey of potential providers of services to severely handicapped children and youth across the nation. The survey was conducted for the purpose of creating a pool of providers from which 100 facilities could be selected for site visits. From the 1,550 respondents to the mail survey, 100 providers were selected who serve severely handicapped clients aged 21 and under. The selection of the 100 providers was accomplished by grouping the respondents to the survey into eight sampling categories according to whether they offered primarily day or residential services and according to the number of severely handicapped clients aged 21 and under they served. In order to obtain a final sample of providers which served clients with a range of handicapping conditions, providers were also selected based upon whether they served a majority of clients who are either severely mentally retarded, severely emotionally disturbed, deaf-blind, or severely multiply-handicapped. In addition, some providers were selected who served a mixed severely handicapped population.

Phase III of the study consisted of data collection, analysis and report writing. Each of the 100 providers in the final sample were visited by two Abt Associates field staff for approximately two days during May or June, 1974. During these visits the Abt Associates field staff conducted interviews with the program or institution director; selected ward, unit or classroom staff who were most knowledgeable about the services being offered to severely handicapped clients; and the budget director or other personnel most knowledgeable about the provider's budget and costs of services. In addition, one member of the field team spent one of the two days observing severely handicapped clients throughout the facility. These data were analyzed by Abt Associates project

staff and descriptive case studies were written to provide a composite picture of the characteristics, quality, and costs of provider services to severely handicapped clients.

The output of the study consists of a four-volume final report as follows:

Volume 1: A State-of-the-Art Paper
Volume 2: A Selected, Annotated Bibliography
Volume 3: Data Analysis and Results
Volume 4: Case Studies of Provider Services

This volume will contain a discussion of: the procedures and methodology used in conducting all phases of the study (Chapter 2); characteristics of the 100 providers (Chapter 3); client observations (Chapter 4); costs of services (Chapter 5); the relationship of expenditure and quality (Chapter 6); a summary of major findings (Chapter 7); and finally specific policy questions and suggestions based on the present data base and/or the expertise of project staff (Chapter 8).

2.0 PROCEDURES AND METHODOLOGY

This chapter presents the procedures and methodologies used in conducting each of the three phases of the present study.

2.1 Phase I: Review of the Literature

The first task of this project was an extensive review of the literature relating to severely handicapped children and youth. This review resulted in two products: a state-of-the-art paper on research and services relating to severely handicapped children and youth (Volume 1) and an annotated bibliography of the same body of literature (Volume 2).

The primary reference sources for these products were the ERIC Clearinghouse for Exceptional Children of the Council for Exceptional Children, who are responsible for the Exceptional Child Abstracts and Bibliography Series. Our procedure was to cull each of the volumes in the series, identifying items which seemed to be concerned with the population of interest to the study. The next step was to consult the journal, hard copy, or microfiche referenced in the Abstracts. In addition, over 400 letters were sent to various public and private agencies, publishers, and and researchers to collect articles, pamphlets, compendia of state legislation, incidence figures, directories of providers, and other relevant materials.

Although the literature scanned covered every type of handicap, we included only those materials which related to severely mentally retarded, severely emotionally disturbed, deaf-blind and severely multiply-handicapped children and youth. Only those materials published during or after 1965 were included in the search. Exceptions were made in the cases of certain classic works, but in general these were referenced indirectly; that is, through various bibliographies and reviews of research in the relevant areas. Mussen's Third Edition (1970) of Carmichael's Manual of Child Psychology, Trapp and Himelstein's (1972) Readings on the Exceptional Child, and Travers' (1973) Review of Research on Teaching, to cite but a few examples, provided this type of reference material.

All the abstracts were listed in alphabetical order in the major section of the Bibliography. These references were then listed under the four handicapping conditions: Mentally Retarded, Emotionally Disturbed, Deaf-Blind, and Multiply-Handicapped. Some materials, particularly tests, fell within more than one of these categories. Where the consensus of the reviewers was that an item had multiple foci it was listed wherever appropriate. While this created some redundancy, it was felt that the convenience it offered to the reader was sufficient justification for the procedure.

2.2 Phase II: Study Design and Field Preparation

The tasks involved in completing Phase II of the project were the identification and selection of 100 provider sites, instrument development, and selection and training of field staff.

2.2.1 Initial mail survey

In order to identify the pool of providers of services to severely handicapped children and youth, a Mail Questionnaire was sent to approximately 5,000 providers of services to handicapped people. The list of 5,000 providers was compiled from the Special Education Information Center (SEIC) listing of facilities serving the handicapped and from the Porter Sargent Directory (1973 edition). Because the SEIC was the only existing comprehensive national directory of facilities serving handicapped children and youth, our mailing list was based on its contents. A further benefit of the SEIC listing was that it existed in computerized form, making its use in this project very easy. However, the SEIC list had some known deficiencies, centering around the fact that its information was compiled in 1971. The more recent Porter Sargent directory was consulted to identify any facilities that were not included in the SEIC listing, and these new names were added to the mailing list; however, the majority of the 5,000 addresses were drawn from the SEIC listing. Those facilities that had closed or moved since the SEIC directory was compiled could not be systematically identified, so questionnaires were sent to all institutions in the final list with the realization that a number of questionnaires would be undeliverable.

The questionnaire had one main purpose: to yield enough information about the providers so that a sample of 100 could be drawn which represented a broad range of provider types. The first question determined whether or not the provider served children and youth who were severely handicapped according to the behavioral definition used by Abt Associates throughout the project. The other main variables covered in the Mail Questionnaire were provider sponsorship (public/private); size of the total population served; size of the severely handicapped population; handicapping conditions served; day versus residential services; estimated costs; and the imputed value of volunteer services.

The questionnaires were mailed on January 14 through 18, 1974, and responses were accepted until February 15, 1974. Responses from the 5,000 mailed questionnaires are shown in Table 2-1. Due to the fact that the SEIC list had been compiled in 1971, over 20% of the questionnaires were undeliverable and returned by the Postal Service.

The providers that indicated they served severely handicapped children and youth (aged 21 and under) were organized into eight major sampling categories or "design cells" according to the size of the severely handicapped population served, and whether the provider offered day or residential services. Providers offering both day and residential services were considered residential for purposes of site selection. Within each of the eight cells, providers were organized by the primary handicapping condition of clients served. If a clear majority of clients with one handicapping condition was not served, then the provider was classified as "mixed." Table 2-2 displays the distribution of providers who responded to the questionnaire.

Upon examination of the actual questionnaires, it was determined that virtually all the providers which fell in the day >200 cell were actually outpatient or diagnostic clinics providing a total of only a few hours of services to an individual client, rather than serving a group of clients on a daily basis. Therefore, this design cell was eliminated.

Table 2-1: Questionnaire Responses

Category	Number	% of 3,950 (total mailing not including undeliverables)	% of 5,000 (total mailing)
Processed and served severely handicapped clients aged 21 and under	779	20%*	16%
Processed and did not serve severely handicapped clients aged 21 and under	754	19%*	15%
Undeliverable (sent back to Abt Assoc.)	1,050	---	21%
Late returns (unprocessed)	232	6%*	5%
Non-respondents	2,185	55%	43%

*For a total return rate of 45% of questionnaires delivered.

Table 2-2: Frequency Distribution of Survey Respondents Serving Severely Handicapped Clients

Size*	Day					Residential**				
	MR	ED	DB	MH	MIX	MR	ED	DB	MH	MIX
<10	13	14	3	12	19	12	21	3	3	18
Total Cases: 118	Total: 61					Total: 57				
10-50	30	34	3	20	73	42	72	4	13	41
Total Cases: 332	Total: 160					Total: 172				
51-200	25	10	1	30	51	31	37	3	14	41
Total Cases: 243	Total: 117					Total: 126				
>200	7	7	1	4	12	16	6	0	3	30
Total Cases: 86	Total: 31					Total: 55				

*Size of severely handicapped population aged 21 and under
**Includes providers offering both day and residential services

KEY: MR=Mentally Retarded; ED=Emotionally Disturbed; DB=Deaf-Blind; MH=Multiply-Handicapped; MIX=Mixed Handicaps

2.2.2 Site Selection

Once each qualified respondent to the Mail Questionnaire was assigned to an appropriate design cell, the site selection process began. The purpose of the site selection was to arrive at a final sample of 100 providers which represented a range of provider types (as defined by size, day versus residential services, primary handicapping condition served, public vs. private control, and, to a limited extent, estimated costs). In addition, a maximum geographic distribution was sought to minimize the extent to which any state was overrepresented while others were omitted.

Random numbers were used to select the initial 100 providers and a backup sample of 200 sites. The initial group was then screened to determine if, for example, a provider had been misclassified or was otherwise inappropriate for inclusion in the study; if so, it was dropped from the primary sample and a backup site was substituted. Sites were considered inappropriate for the field visits if the number of severely handicapped clients served by the provider was fewer than four; if the site had already been selected for participation in the P.L. 89-313 evaluation being conducted by Exotech Systems, Inc.; or if the provider only served clients on an outpatient or diagnostic basis.

The 100 selected providers were sent a letter asking if they would be willing to participate as a field site in the study, as well as a letter signed by Associate Commissioner Edward Martin of the Bureau of Education for the Handicapped requesting that the site participate in the project. These letters provided the sites with a full description of Abt Associates' information needs as well as the approximate amount of staff time which would be necessary to respond to the questionnaires. All 100 sites were then contacted by telephone to determine whether or not they would participate in the study. During this call providers were asked, once again, whether they served severely handicapped clients according to the standard definition included in the Mail Questionnaire. This definition was read to the director of the provider and the importance of ensuring that some portion of the population served by the provider corresponded to the definition was emphasized. As a result of this process, thirteen of the original 100 sites were eliminated due to the fact that they did not serve severely handicapped clients according to the definition used in the study, and thirteen new sites were substituted from the backup sample.

Overall, a total of 29 of the original 100 providers chosen to participate as field sites were eliminated subsequent to the initial telephone call, including the 13 providers eliminated above. Other reasons for the elimination of sites included the fact that the provider was closing down (three cases); was in the middle of moving or had just moved to a new facility (four cases); or the provider simply did not wish to participate in the study for unstated reasons (five cases). In general, every site contacted was cooperative and eager to assist the study in whatever way possible.

The major problem encountered in site selection was in locating providers that served severely emotionally disturbed clients. Most of the providers contacted served children with various behavioral problems that were severe in the context of a public school classroom, but were not severe by the standard definition being used in the study. Frequently, the only way to emphasize to providers the severity of handicap of interest to the study was to specify that the clients should be autistic, schizophrenic, psychotic or pre-psychotic, not delinquent, learning disabled or simply "behavior problems." Another difficulty encountered was in locating providers serving fewer than ten severely handicapped clients. Approximately 50% of all providers in the <10 design cell served fewer than four severely handicapped clients. It was decided to eliminate all providers having fewer than four severely handicapped clients due to the general unreliability of the estimates and the fact that these clients might not be enrolled in the provider by the time of the site visit, three months later. A logistical problem involved in arranging the site visits was the occasional difficulty in reaching the key people within a provider who could make a decision about participation or who, once the decision was made, had to be involved in arranging the details of the visit. Overall, this was not a major problem, with provider directors giving willingly of their time on the telephone to ensure a smooth visit; however, it was often necessary to make two or three calls to the provider before the appropriate personnel could be reached.

Table 2-3 outlines the characteristics of the final sample.

Table 2-3: Sample Characteristics*

Size**	Day Only					Residential and Day				
	MR	ED	DB	MH	MIX	MR	ED	DB	MH	MIX
<10	3	2	3	2	4	3	4	1	0	5
Total Cases: 27	Public: 7 Private: 7					Public: 4 Private: 9				
	Population: range: 4-10 total: 94 average: 7					Population: range: 3-10 total: 84 average: 6				
10-50	3	4	1	3	4	5	4	1	3	2
Total Cases: 30	Public: 4 Private: 11					Public: 8 Private: 7				
	Population: range: 11-47 total: 299 average: 21					Population: range: 21-50 total: 490 average: 33				
51-200	3	3	0	3	4	3	4	2	3	4
Total Cases: 29	Public: 5 Private: 8					Public: 8 Private: 8				
	Population: range: 51-200 total: 1,137 average: 87					Population: range: 50-124 total: 1,263 average: 79				
>200						4	2	0	1	7
Total Cases: 14						Public: 12 Private: 1 Unknown: 1				
						Population: range: 200-908 total: 5,108 average: 365				

*Some providers were reclassified following data collection. See Table 3-1, page 40, for final sample status.

**Size of severely handicapped population aged 21 and under.

KEY: MR = Mentally Retarded
ED = Emotionally Disturbed
DB = Deaf-Blind
MH = Multiply-Handicapped
MIX = Mixed Handicaps

2.2.3 Instrument development

In order to gather the data necessary for the case studies and analysis, four instruments were developed and pretested by Abt Associates' project staff. Table 2-4 provides brief descriptions of these instruments and their data sources. Because the providers varied greatly in terms of their organizational characteristics, the field teams had to exercise judgment in determining which persons were the most appropriate respondents for each of the interviews. For the Director's Questionnaire, the director

Table 2-4: Data Sources and Descriptions of Field Instruments

Instrument	Data Source	Instrument Content
Director's Questionnaire	Director of Provider	Overall characteristics, policies, and purposes of the provider and its services to severely handicapped children and youth including information on admissions, discharges, staff training, visiting procedures, parent and community involvement, and program evaluation
Staff Questionnaire	Unit or Ward Directors, Classroom Teachers	Specific services offered to severely handicapped clients, characteristics of client population and the staff serving them, educational techniques and teaching materials used, data from client assessments performed by provider, staff assessment of skill level of clients
Cost Questionnaire	Budget Director or Other Appropriate Cost Personnel	Total annual operating expenditure, total personnel costs, total non-personnel costs, parents' fees, funding sources
Observation Schedule	Clients and Staff	Behaviors and activities of clients, staff-client interactions

or assistant director of the total provider or of the major provider component serving the target population (e.g., Director of the Children's Unit; Director of the Deaf-Blind Program) were interviewed in all cases. In administering the Staff Questionnaire, field team members interviewed staff having direct knowledge of severely handicapped clients, the specific services received by these clients, and the staff providing these services. The range of respondents for the Staff Questionnaire included unit directors, head teachers, directors of social work, school principals or directors of education, and directors of residential services. The respondents were often interviewed in small groups in order to minimize the time of both the provider and the Abt Associates' staff. The Cost Questionnaire was administered to the budget or business manager; however, in cases where such personnel did not exist, the director was the typical respondent.

The Observation Schedule was administered by an experienced observer in as many as 12 settings within each provider where the majority of severely handicapped clients aged 21 and under typically spent the majority of their waking hours. The settings in which observations took place included wards, classrooms, workshops, dormitories, dining halls, and playgrounds. A more detailed description of the Observation Schedule and the procedures followed in implementing it may be found in Section 2.4.8 of this volume. In summary, between 30 and 36 clients were randomly selected within each provider and were observed, using a structured observation scale, for periods of five minutes each. In cases where there were fewer than 30 severely handicapped clients who were aged 21 and under at a provider, the same number (30 to 36) of separate observations of individual clients were made. However, in these instances an individual severely handicapped client would be observed more than once. Multiple observations of the same clients were determined using the random selection procedure described in Section 2.4.8.

2.2.4 Field Staff Selection and Training

Site visits to each provider were conducted by a two-member field team composed of an Abt Associates field supervisor and an observer. The field supervisor was responsible for the overall data collection at each site, including the administration of the Director's Questionnaire, the Cost Questionnaire, and the Staff Questionnaire. The observer was responsible for conducting 30 to 36 five-minute observations at each

provider and for assisting in administering the Staff Questionnaire in providers where there were large numbers of staff respondents.

Abt Associates staff with experience in conducting site visits, administering complex questionnaires, gathering cost data and supervising the work of other field staff, were selected by the project director and deputy project director to serve as field supervisors. For the position of observer, persons with observation skills and previous work experience with severely handicapped clients were recruited. Personal interviews with applicants were conducted by the project director and deputy project director in order to select observers with these qualifications. Observers hired by Abt Associates for this study included graduate students in special education and psychology as well as professionals working in providers serving severely handicapped children.

The Abt Associates field supervisors and observers both received one week of training before entering the field. In addition to formal training sessions, a field manual outlining all field procedures was prepared for each staff member to utilize on site. This manual served as a resource to staff in the field who wished to review topics which had been covered during training. The training of field supervisors included an orientation to the project; introduction to general interviewing procedures; and specific instructions in the use of the Director's, Staff, and Cost Questionnaires. During the training, field supervisors utilized sample sets of data representing a variety of problems likely to be encountered in the field. Training for observers included an overview of the project; general interviewing techniques; instructions in the use of the Staff Questionnaire; orientation to general observation techniques; and specific instructions on the use of the Observation Schedule and scoring procedures. Videotapes of typical observation settings as well as on-site observations at a state school for retarded persons were used to train observers in the use of the Observation Schedule. The observers' ratings on the videotape episodes were reviewed item by item to identify individual problem areas and to establish high inter-rater reliability. Individual training sessions were then held with each observer to review those specific items which required further clarification.

2.3 Phase III: Data Collection, Analysis and Reporting

Because of the large number of providers participating in the study, site visits were scheduled in two waves. During Wave I (April 29 - May 15) 54 providers were visited; during Wave II (May 29 - June 14) the remaining 46 site visits took place. The 100 sites were divided into regions which typically contained five providers in reasonable geographic proximity. Field teams were assigned to conduct visits within a particular region in order to minimize costs and travel time. Before the site visits took place, the director of each provider was contacted by the field supervisor responsible for the site to make arrangements for the visit. During these telephone calls, the field supervisor outlined the information needed during the site visit and asked the director for information on the names and availability of the appropriate staff to be interviewed as well as the settings to be observed. On the basis of this information, tentative schedules for the site visits were drawn up by the field supervisor and confirmed by the director of the provider. Because all of these arrangements were completed before the actual visit, the field team was able to spend its time most effectively while on site.

The two Abt Associates field team members typically spent two days at each site. In some cases, however, it was necessary to spend up to four days at a site because of the large number of staff to be interviewed, or settings to observe in, or because the cost data was difficult to collect. During a typical two-day visit, the field supervisor spent the first day interviewing the director and the cost personnel; the second day was spent completing the Cost Questionnaire and administering the Staff Questionnaire. The observer typically spent the first day observing; the second day was spent completing the observations and assisting the field supervisor in interviewing staff.

The Abt Associates field teams were very well received at nearly every site. In general, the provider staff were extremely cooperative in providing Abt Associates staff with the necessary data. In the vast

majority of providers the observers were able to move from setting to setting to conduct the observations without any difficulty or disruption to the provider staff and clients. However, there were some problems which occurred in several sites and therefore deserve mention:

1. Absence of severely handicapped clients: In a number of cases, the field teams felt that there were fewer severely handicapped clients in the provider than the director had estimated. In a few cases, the field team felt that there were no severely handicapped clients according to our definition. In cases where the estimates were in question, the definition of "severely handicapped" was reviewed with the director to determine whether the estimate should be changed. There remained, however, some discrepancy between a few providers' and the field staff's estimates.

2. Lack of cost data: It was often very difficult to break out the provider's costs of serving severely handicapped clients, and some field supervisors experienced difficulty in gaining access to the accounting books and budgets at the providers.

3. Inability to observe: In one site the provider would not allow any observations to be performed.

Upon receipt of completed questionnaires from field staff members, a sequence of quality control and coding was begun. Clerical staff inspected each completed form for completeness and legibility. The more complex cost questionnaires had their internal computations checked by senior project staff members. When the questionnaires had been inspected and prepared for keypunching, a set of data cards for each questionnaire was punched. These cards were used to create data files for each of the questionnaires, which were eventually merged into a single data file from which all analyses were drawn. Site names were not included among the data input to the computer, although traceable identification numbers were. This was required to allow tracing of uncoded open-ended responses in case study reports.

The data file was inspected for illegal values. Due to the relatively small sample size, erroneous punches were corrected by reference to hard copy of the appropriate questionnaire. In some cases, data collected in the field required reclassification of providers into case study cells different from those to which they were assigned before site visits. Finally, variables that are composites of single questionnaire items (such as the quality indicators or cost information) were computed.

All analyses were conducted using the routines from the Statistical Package for the Social Sciences (SPSS) and were conducted on the CDC 6400 computer located at the computing center of the Smithsonian Astrophysical Observatory in Cambridge, Massachusetts.

2.4 Definition of Terms

This section will define some of the terms and variables used throughout this report. The first four variables are those used in the set of descriptive tables presented in Chapter 3 of this volume.

2.4.1 Provider Service Type

All providers were classified into one of three types regarding the residential nature of their services. Day providers are those providing non-residential (day) services only; Residential providers are those that provide overnight services at least five days per week; and Mixed providers are those offering services to some clients on a day (non-residential) basis and residential services to other clients.

In some cases, we wished to make a distinction between the day services offered by a provider (either a day or mixed provider) and the residential services offered (by either a residential or mixed provider). In such cases, we have used the term day or residential program of a provider. Any client may be classified as belonging to the day or residential program of a provider. Mixed providers have both a day and a residential program.

2.4.2 Provider Client Type

In early conceptualization of the present study a number of categorizations of providers were considered, ultimately resulting in the design illustrated by the case studies (Volume 4). This design looks at five types of providers classified according to the primary handicapping condition of their client population, as well as at day, residential and mixed design cells.

In the present volume, we have used the variable which classifies providers into their case study design cells (i.e., primary client type) as one of the major analytic variables. The five categories which comprise this variable are:

- Mentally retarded;
- Emotionally disturbed;
- Deaf-blind;
- Multiply-handicapped; and
- Mixed.

A provider is defined as being in one of the first four categories if 75% or more of the severely handicapped clients it serves have that condition as their primary handicap. Providers that do not have a clear majority of any type of severely handicapped clients are classified as mixed. Readers are referred to the case study volume (Volume 4) for further description of the design cells.

2.4.3 Size

For certain analytical purposes, we have divided the 100 providers into four size categories based on their enrollment of severely handicapped clients age 21 and under. In many cases, this number is less than the total enrollment of the provider: Some clients are served that are either not severely handicapped, have other handicapping conditions not covered by the study (e.g., blind, deaf, physically handicapped), or are over 21 years of age, or both. The four size categories are:

- Less than 10
- 10 to 50
- 51 to 200
- Over 200

2.4.4 Control

The administrative control of each provider is classified as either public or private. Public providers are those operated directly by some public agency (i.e., a division of a state, county or local government). This would include providers operated by such an agency as local school

departments or state departments of mental health. Private providers are those operated by a non-public agency. This may be a charitable organization, a non-profit corporation, or a for-profit corporation. Of course, private providers receive some public funding; however, their direct administrative control does not come from a public agency.

2.4.5 Job Categories

Any attempt to categorize the functions of personnel in social service programs using their job titles is generally unsuccessful, due to the fact that a person with a given job title in one provider may have quite different functional responsibilities than a person with the same title in a different provider; likewise, identical functions may be performed by persons with different job titles, even in the same institution.

A set of twelve functionally-defined job categories were developed for the purposes of this study. These job categories, which appear below, represent the range of role functions which exist in most providers serving handicapped clients. The 100 providers included in the study were asked to apply these standard categories to their staffs even though the titles used in their facilities might differ substantially. The 12 staff job categories used in the study are as follows:

(1) Administrator: This includes the staff whose primary function is supervising other staff, or assisting in the management of the organization rather than direct care of clients. Examples of staff included are: Director, Business Manager, Accountant, Personnel Director, Secretaries, Clerks, Receptionist, Division or Unit Directors, Program Coordinators, etc.

(2) Medical Doctor: This includes all physicians except psychiatrists.

(3) Psychiatrist: This includes only psychiatrists.

(4) Psychologist: This includes all staff who perform various psychological functions such as counseling, staff consultation, testing, regardless of specific degree. Included can be people called psychologists who have B.A.'s, M.A.'s or Ph.D.'s in psychology or counseling.

(5) Social Worker: This includes all staff who perform various social work functions including counseling, community liaison, welfare and other payment negotiations, regardless of specific degree. Included can be people called social workers who have a B.S.W., M.S.W., or other related degrees.

(6) Therapist: This includes staff who perform various types of therapy other than counseling. Specifically, this includes occupational therapists, speech therapists, recreation therapists, physical therapists, music therapists. Included are licensed therapists, aides and assistants.

(7) Nurse: Included here are staff who perform primarily nursing functions such as dispensing medications, assisting physicians, etc. Included are both Registered Nurses and Licensed Practical Nurses as well as physician's assistants, medics, etc.

(8) Attendant: Included here are staff whose primary function is to take care of the basic needs of clients such as toileting, feeding, dressing, etc. They are considered attendants even if there are other more habilitative roles assigned in addition to these primary functions. These are generally jobs for which there is no special requirement in terms of training or education.

(9) Teacher (Certified): Included here are certified teachers.

(10) Teacher (Noncertified or Aides): Included here are staff used as integral parts of the educational or habilitative program but who have less education and training than full teachers, or who are not certified. Frequently they work with a certified teacher.

(11) Support Staff: This includes staff who perform non-direct service jobs which are primarily oriented towards maintenance and operation of the facility. Included are cooks, drivers, janitors, maintenance men, laundry workers, etc.

(12) Other: All staff not covered in the above categories. Examples include pharmacists, research staff, etc.

2.4.6 Service Areas

Seven discrete service areas or components were identified which constitute the range of provider services to severely handicapped clients. Providers were asked to estimate how much time is spent in providing each of the seven types of service to severely handicapped children and youth (excluding administration and support staff). Therefore, data were collected on the approximate amount of time therapists, teachers, psychiatrists, etc. spend on each service component at each of the 100 providers studied. The service components used in the study are as follows:

(1) Basic Care: This includes feeding clients, toileting and dressing clients, providing routine medical services such as dispensing of medications, band-aids, temperature taking, and general supervision of clients in a group.

(2) Educational and Habilitative Services: This includes all direct services for clients which are aimed at improving their level of self-sufficiency and intellectual functioning. Specifically, we are concerned with education and instructional services, prevocational and vocational training, occupational therapy, recreation, speech therapy, sensory awareness activities, music therapy, etc.

(3) Medical Services: This includes all direct services for clients which are aimed at improving their physical condition. Specifically, we are concerned with regular periodic medical and dental examinations, specialized medical services including corrective surgery aimed at improving appearance as well as physical capability, and physical therapy.

(4) Family and Community Services: This includes all services not aimed directly at the clients who are served at the facility, but aimed at clients' parents, siblings, and their community, as well as at clients in other programs or at home. This includes counseling for families, parent meetings, community education efforts such as lectures and mass media exposure, home visits, and consultation.

(5) Diagnosis and Referral Services: This includes services aimed not at directly benefitting the client, but at ensuring that the client receives the most appropriate services. Included here are client outreach and identification, testing, diagnosis and client assessment, referral to other agencies, placement in appropriate programs, and follow up of clients.

(6) Administration and Staff Support: This includes services oriented towards the management of the facility and the supervision of staff. Included would be staff recruiting, training and supervision, policy formulation and implementation.

(7) Support Services: This includes all services aimed at operation of the facility such as food preparation, laundry, building maintenance, and repairs.

2.4.7 Costs of Provider Services for Survey Year

In calculating the costs of the 100 providers included in the study, the expenditures of serving severely handicapped clients aged 21 and under, were separated from expenditures of serving other clients at the provider (i.e., non-severely handicapped clients and/or clients over age 21). Therefore, all expenditures described in this report refer only to the expenditures of serving severely mentally retarded, severely

emotionally disturbed, deaf-blind and severely multiply-handicapped children and youth, aged 21 and under.

For the purpose of the cost analysis, all expenditures were considered to be either personnel or non-personnel items. The category of "personnel expenditures" includes the salaries of provider personnel in each of the 12 staff categories used in the study; salaries of consultants and contracted personnel; and fringe benefits (FICA, health insurance, life insurance, tuition reimbursements, and retirement). Non-personnel expenditures include space, transportation, consumable supplies, capital outlay, equipment rental, property insurance, taxes and non-personnel contracts. Variables were constructed to describe the relative contribution to total expenditures of personnel and non-personnel expenditures. Similarly, the contribution of personnel expenditures for the seven service areas described in Section 2.4.5 were calculated as a percent of total personnel expenditures.

Estimates of expenditures were obtained from the official records and knowledgeable personnel of each provider. The primary source of information was formal records of expenditure (such as ledgers) or audited annual reports. Where these were not available, budget estimates for the fiscal period under study were consulted, with staff members of the provider making adjustments in budget line items where needed. In general, accurate estimates of total expenditures were obtained. Personnel information was especially accurate since it must be maintained for income tax and FICA reporting purposes. Difficulties occasionally arose in identifying the exact purpose of particular ledger items so that they could be assigned to their proper cost categories. In such cases, administrative personnel of the provider (such as a staff accountant or budget director) were consulted to explain in more detail the nature of these items.

Costs were classified into the following personnel and non-personnel categories which were totaled to estimate personnel and non-personnel costs:

Personnel Expenditures

- Staff salaries
- Fringe Benefits (FICA, insurance, etc.)
- Consultant Expenditures

Non-Personnel Expenditures

- Contract Services
- Travel Expenditures
- Consumable Supplies
- Space Expenditures (Rent or Mortgage)
- Utilities
- Maintenance and Repairs
- Equipment Rental
- Insurance
- Taxes
- Interest Expenses
- Capital Expenses
- Other Non-Personnel

The costs reported were those incurred in serving severely handicapped clients aged 21 and under only. For providers whose populations included clients other than our target population, the amount of non-personnel expenditures specifically expended to serve severely handicapped children and youth was estimated by using as a pro-ration factor equal to the size of the target population as a proportion of the total provider population. That is, if the number of severely handicapped children and youth in a provider constituted 80% of the total population, then we estimated that 80% of the expenditures for non-personnel items were devoted to severely handicapped children and youth. In some instances it was felt by provider personnel that their severely handicapped clients actually received a disporportionately large (or small) share of certain non-personnel items. In these cases, the estimated pro-ration factor supplied by provider staff was

used. Personnel expenditures were estimated by having staff members (or knowledgeable provider personnel) estimate the amount of time spent in contact with or otherwise serving severely handicapped clients. This proportion was used to obtain a pro-rated salary expense.

For providers having both day and residential service components, a similar process was used to separate expenditures for each component. Staff time spent with clients in each component was estimated. Certain costs were readily identifiable as for exclusively day (e.g. transportation to the day program) or residential (e.g. laundry) activities. The remainder of the costs were apportioned according to the day/residential makeup of the severely handicapped client population studied, again after checking the validity of such an estimate with the director and accountant.

2.4.8 The Observation Schedule and Observation Procedures

The Observation Schedule was adapted from observation instruments which were developed by M. Michael Klaber for use in his study, Retardates in Residence, A Study of Institutions (1967), University of Hartford, West Hartford, Connecticut. With Dr. Klaber's permission the format of the original instruments was extensively modified for use in this study; however, a considerable number of the variables and their operational definitions have been retained in their original form. The modified form used in this study has two parts: the Observation Coversheet, on which data describing the observation setting were recorded; and the Observation Schedule itself. A copy is included as the following two pages.

The Observation Schedule was designed to record the behaviors and activities of severely handicapped subjects and any interactions they had with other persons in their environment: the staff or other clients. The OS provided "snapshots" of each subject's daily life in the provider and a general flavor of the provider's context by recording the behaviors of specific subjects, as well as the subjects' interactions with their environment, and other clients' behaviors and interactions. The Observation Schedule was divided into two major sections -- Client Items and Staff Items. The behaviors of the subject and any other clients in the observation setting were recorded under the Client section (left half of the Observation Schedule). Similarly, any staff behaviors observed

OBSERVATION INSTRUMENT

1 2 3 4

NAME OF FACILITY: _____

NAME OF CONTACT PERSON: _____

OBSERVER'S NAME: _____ DATE: _____

TIME BEGUN: _____ TIME FINISHED: _____

BEFORE OBSERVATION

5. HOMOGENEOUS/HETEROGENEOUS GROUP

(% = s.h. clients 21 and under)

(1) ____ 0-20%
(2) ____ 21-40%
(3) ____ 41-60%
(4) ____ 61-80%
(5) ____ 81-99%
(6) ____ 100%
(0) ____ No estimate

6. SETTING

(1) ____ Ward
(2) ____ Living Room/ Day Room
(3) ____ Workshop
(4) ____ Dining Room/ Cafeteria
(5) ____ Bedroom/Bathroom
(6) ____ Classroom/Library
(7) ____ Gym/Auditorium
(8) ____ Therapy Room
(9) ____ Outside

STAFF-CLIENT COUNT

7-8. ____ Clients in Bed/Cribs
9-10. ____ Clients out of Bed/Cribs
11-13. ____ Staff, Total

12. SEX OF GROUP

(1) ____ All Male
(2) ____ All Female
(3) ____ Mixed Group

AFTER OBSERVATION

14. LEVEL OF INSTITUTIONALIZATION

(1) ____ Low
(2) ____ Moderate
(3) ____ High

15. CONDITION OF INTERIOR BUILDING

(1) ____ In Excellent Repair
(2) ____ Moderately Well Kept Up
(3) ____ In Poor Repair

16. PERSONAL APPEARANCE OF CLIENTS

(1) ____ Adequately Clothed
(2) ____ Ill-Fitting/Unclean Clothes
(3) ____ Inappropriately Clothed
(4) ____ Partially or Completely Denuded
(5) ____ Most Adequately Clothed, Some in Ill-Fitting, Unclean Clothes
(6) ____ Most Adequately Clothed, Some in Inappropriate Clothes
(7) ____ Most Adequately Clothed, Some Partially or Completely Denuded

17. ODOR OF SETTING

(1) ____ Neutral
(2) ____ Antiseptic
(3) ____ Noxious

18. SLEEPING PRIVACY (If appropriate)

(1) ____ Very Private
(2) ____ Somewhat Private
(3) ____ Not Private

19. TOILETING PRIVACY

(1) ____ Very Private
(2) ____ Somewhat Private
(3) ____ Not Private

20. GENERAL ACTIVITY LEVEL

(1) ____ Low
(2) ____ Moderate
(3) ____ High

21. TYPE OF ACTIVITY

(1) ____ Mealtime or Snacktime
(2) ____ Naptime
(3) ____ Instruction in Vocational Activities
(4) ____ Instruction in Recreational Activity
(5) ____ Instruction in Educational Areas
(6) ____ Instruction in Self-Care
(7) ____ Basic Care
(8) ____ Free Play
(9) ____ Therapy
(0) ____ No Activities Observed

22. PRESENCE OF OPERANT CONDITIONING

(1) ____ Observed
(2) ____ Not Observed

23. PLAY MATERIALS AVAILABLE

(1) ____ None
(2) ____ Few/Some
(3) ____ Adequate

24. CONDITION OF MATERIALS

(1) ____ Excellent
(2) ____ Good
(3) ____ Fair
(4) ____ Poor
(5) ____ Not Applicable

25. QUALITY OF MATERIALS

(1) ____ High
(2) ____ Moderate
(3) ____ Low
(4) ____ Not Applicable

OBSERVATION FORMAT (OS)

SERIES NUMBER: _____ PROVIDER CODE: _____

OBSERVER: _____

	CLIENT 1		2		3	
	Ind.	Grp.	Ind.	Grp.	Ind.	Grp.
INNER DIRECTED BEHAVIOR						
26. Smiles, Laughs						
27. Whines						
28. Cries						
29. Stereotyped Activity						
30. Moves Without Apparent Purpose						
31. Inactive						
32. Sleeps						
33. Eats						
34. In Restraint						
OUTER DIRECTED BEHAVIOR						
35. Smiles, Laughs						
36. Cries						
37. Listens or Watches Others						
38. Watches TV						
39. Waits						
40. Approaches Peer						
41. Approaches Staff						
42. Responds to Peer						
43. Responds to Staff						
44. No Response to Stimulus						
45. Withdraws from Others						
Plays with						
46. Toys						
47. Objects						
48. Peers						
49. Staff						
50. Converses with Peer						
51. Converses with Staff						
52. Participates in Group						
53. Does Chores						
54. Destructive						
55. Aggressive to Peer						
56. Aggressive to Staff						

	STAFF 1	2	3
INNER DIRECTED BEHAVIOR			
26. Inactive			
27. Chats with Staff			
28. Self-Oriented			
STAFF-ORIENTED BEHAVIOR			
29. Housekeeping			
30. Food			
31. Medications			
32. Reports			
33. Discuss Work with Staff			
34. Discuss Clients in Their Presence			
35. Supervision, by Presence Only			

	1 Ind.	1 Grp.	2 Ind.	2 Grp.	3 Ind.	3 Grp.
OUTER DIRECTED BEHAVIOR						
36. Dresses/Grooms						
37. Feeds						
38. Bathes/Washes						
39. Toilets/Diapers						
40. Moves						
41. Responds to Client's Approach						
42. Does Not Respond to Approach						
Communicates with Client						
43. Questions						
44. Commands						
45. Encourages						
46. Warns						
47. Instructs						
48. Converses						
49. Demonstrates Affection						
50. Offers Materials						
51. Plays						
52. Organizes Activities						
53. Restrains						
Punishes						
54. Scolds						
55. Unnecessary Interrupts						
56. Physical Aggression						

were recorded on the Staff section (right half of the Observation Schedule). There is space for three client/staff observations on one Observation Schedule.

The method of observation used in this study called for systematic sampling of staff/client interactions in a variety of settings at a variety of times during the day. One observer observed at each provider for approximately one eight-hour day, starting at 8:30 a.m. Observations were of five minutes duration, followed by a rest period of five minutes, after which a new observation of another subject began. Observations were conducted in series of three. Hence, in an eight-hour day approximately 12 series of observations (or 36 observations of individual children) were completed.

Observations were performed in those settings within the provider where the majority of the handicapped clients aged 21 and under spent their typical day. "Settings" refer to any locations within the provider where severely handicapped clients spent the majority of their waking hours, including wards, units, classrooms, recreation rooms, playground, cafeterias, infirmaries and hospitals, etc. These locations were determined by provider staff, although the observers made some decisions about the appropriateness of particular settings and generally assisted the selection process.

In an attempt to select three children randomly for each of the observation series, the following procedure was used: as the observer entered the observation setting, he or she selected the fifth client from the left, the third client from the right and the client closest to the middle of the room, as the three subjects to be observed in that observation series.

Observation samples were recorded for five minutes, followed by a rest period of five minutes, after which a new observation period began. During the observation period, the observer placed checks in the appropriate columns of the Observation Schedule as the behaviors and activities occurred. Check marks were scored on a three-point basis; one check in a box indicated that the particular behavior or activity was observed only minimally (once or twice), two checks indicated that the behavior was

moderately prevalent during the observation period (three or four times), and three checks indicated that the behavior was highly prevalent during the observation period (five times or more). During the five-minute rest period which followed each observation, the observer reviewed the observations just coded to make sure that the scoring adequately reflected what was actually going on during the observation period.

2.4.9 Quality

Construction of a model or index of "quality" for providers of services to severely handicapped children and youth was undertaken during Phase II of the study. The quality index indentifies six major service areas in which the characteristics of a provider are judged according to standards of high, medium, or low quality. Data for constructing the quality index were drawn from each of the four major instruments used in the study -- the Director's Questionnaire, the Staff Questionnaire, the Cost Questionnaire and the Observation Schedule, including its Coversheet.

The same quality standards have been used for all providers included in the study, with occasional provisions made for differences between day and residential facilities. The eighteen quality indices and scoring system used in the study appear below.

QUALITY INDICES AND SCORING SYSTEM

A. EDUCATIONAL/HABILITATIVE OPPORTUNITIES

1. Range of Education/Habilitative Materials: Provider has available and accessible to severely handicapped clients a wide range of materials for educational, habilitative, and recreational use. The materials are capable of stimulating a high degree of client development, are clean and in good repair, and are sufficient in number and variety for all clients.

   Quality Criteria -- Low: few materials are available.
   -- Medium: a range of different materials are available; they are at least in fair condition and of moderate quality; only available sometimes to clients.
   -- High: a wide range of materials which are in at least good condition, of high quality, and are always accessible to severely handicapped clients.

2. High Percentage of Staff Time Spent on Educational/Habilitative Tasks: Staff spend a high percentage of their time providing direct services to clients aimed at improving their level of self-sufficiency and intellectual functioning. Specifically, staff spend a high percentage of time providing educational and instructional services, pre-vocational and vocational training, occupational therapy, recreation, speech therapy, sensory awareness activities, music therapy, etc., to severely handicapped clients age 21 and under.

Quality Criteria

Day
- -- Low: provider staff spend no time or less than 10% of their time on educational/habilitative tasks.
- -- Medium: staff spend at least 10% but less than 50% of their time on educational/habilitative tasks.
- -- High: staff spend more than 50% of their time on educational/habilitative tasks.

Residential
- -- Low: provider staff spend no time or less than 5% of their time on educational/habilitative tasks.
- -- Medium: staff spend at least 5% but less than 50% of their time on educational/habilitative tasks.
- -- High: staff spend more than 50% of their time on educational/habilitative tasks.

3. Amount of Client Time Spent on Educational/Habilitative Tasks: A high percentage of the severely handicapped clients spend a large number of hours during the week in educational/habilitative activities.

Quality Criteria
- -- Low: less than 50% of the clients get any services at all and spend less than 10 hours a week in educational/habilitative activities.
- -- Medium: between 50% and 75% of the clients spend between 10 and 29 hours a week in educational/habilitative activities.
- -- High: more than 76% of the clients spend 30 hours or more a week in educational/habilitative activities.

B. STAFF-CLIENT INTERACTIONS

4. Warm Staff-Client Interactions: Staff encourages clients in their endeavors, demonstrates affection verbally or physically, and converses with clients.

Quality Criteria
-- Low: all three behaviors are absent or are present an average of less than once per observation series.
-- Medium: the three behaviors are present at least once but less than twice per observation series.
-- High: the three behaviors are present an average of at least twice per observation series.

5. Instructive Staff Behaviors: Staff attempts to educate/habilitate clients through instructing them, offering them materials, and playing with them.

Quality Criteria
-- Low: all three behaviors are absent or are present an average of less than once per observation series.
-- Medium: the three behaviors are present at least once but less than twice per observation series.
-- High: the three behaviors are present an average of at least twice per observation series.

C. PARENT INVOLVEMENT

6. Parent Involvement with the Provider: Provider involves parents in the development and operation of most or all of the aspects of the provider's operations including program planning, policy making, evaluation, fund raising, and as volunteers.

Quality Criteria
-- Low: no parent involvement.
-- Medium: parent involvement in at least one activity.
-- High: more than 25% of the parents are involved in at least three activities.

7. Parent Involvement with Their Child: Provider encourages families to visit their child, and where possible, to take their child home for periods of time; parents are involved with staff in discussions about their child, in parent education sessions, and in home visits.

Quality Criteria
-- Low: no parents are involved in any activity; parents never visit their child; no home visits are made.
-- Medium: some parents are involved in activities with their child; in residential providers less than half the parents visit or take their child.
-- High: more than 25% of the parents are involved in activities at the provider; for residential providers over half visit their child and/or take their child home for visits.

D. HUMANIZATION OF INSTITUTIONAL SETTING

8. Respect for Clients: Clients are viewed and treated in a normalizing, dignified way; they are viewed as human beings (not as clinical subjects, animals, or as children when adults); and they are not referred to using derogatory or disrespectful language. This criterion will be measured by the presence or absence of talking about clients in their presence; using derogatory language; and physical aggression by staff to client.

   Quality Criteria -- Low: presence of all of the negative behaviors.
   -- High: absence of all the negative behaviors.

9. Privacy: Program respects the privacy of its individual clients as evidenced by private toileting and bathing areas.

   Quality Criteria -- Low: no private toileting areas.
   -- Medium: somewhat private toileting area.
   -- High: very private toileting area.

10. Non-Institutionalized Environment: Program has few, if any, institutional aspects, is very homelike (e.g., comfortable furniture, drapes, rugs, pictures, private or small bedrooms, private toileting areas, homelike routine to daily activities).

    Quality Criteria -- Low: high level of institutionalization
    -- Medium: moderate level of institutionalization
    -- High: low level of institutionalization

11. Personal Possessions: Clients have well-fitting and appropriate clothing of their own; have personal possessions as well as a private place to keep them.

    Quality Criteria

    Day
    -- Low: virtually all clients are partially or completely denuded or clients are dressed in ill-fitting or unclean clothes.
    -- Medium: some clients are dressed appropriately, some are not.
    -- High: virtually all clients are dressed appropriately.

    Residential
    -- Low: clients are partially or completely denuded and/or have no private possessions.
    -- Medium: some clients are dressed appropriately, some are not; clients have few possessions, no private storage place.
    -- High: clients are dressed appropriately, have possessions and a private place to store them.

12. Physical Comfort: Living and activity areas are well maintained and no unpleasant or noxious odors exist.

    Quality Criteria -- Low: noxious odors and/or interior in poor repair.
    -- Medium: antiseptic odor and moderate physical repair.
    -- High: neutral odor and interior in excellent repair.

E. EXTENT OF TRAINING & EVALUATION

13. Evidence of Client Assessment: Evaluation findings/data have been systematically collected on client growth and development.

Quality Criteria -- Low: no client assessments made.
-- Medium: some client assessments, either in a few areas or only on a few clients.
-- High: requires testing of at least 76% of the clients in at least four areas, e.g., self-sufficiency, IQ, social-emotional skills, achievement, etc.

14. Evidence of Program Evaluation: Evaluations of the provider have been made in the last five years, particularly of the education/habilitation component.

Quality Criteria -- Low: no evaluations performed in last five years.
-- Medium: some evaluation of educational/habilitative services is performed.
-- High: evaluations of educational/habilitative services performed at least once a year.

15. Staff Development Opportunities: Provider offers extensive opportunities for staff to develop their capabilities through training programs (e.g., pre-service training; in-service training; course work paid for by provider).

Quality Criteria -- Low: no training opportunities for staff.
-- Medium: one type of training opportunity is available to staff.
-- High: at least two types of training opportunities are available to staff.

F. CLIENT MOVEMENT

16. Evidence of Client Functional Level Improvement: Clients were either released from the provider or moved to a different setting within the provider due to the fact that their functional level had improved.

Quality Criteria -- Low: no severely handicapped clients were discharged/moved because their functioning level improved.
-- Medium: between 1 and 10% of the severely handicapped clients were discharged because their functioning level improved.
-- High: 11% or more of the severely handicapped clients were discharged because their functioning level improved.

17. Evidence of Movement of Severely Handicapped Clients Out of Provider into Less Sheltered Settings: Provider has released a high percentage of its severely handicapped clients into less sheltered environments. These include natural, foster or adoptive homes or community residences.

Quality Criteria
-- Low: no clients have been moved into less sheltered environments in the past year.
-- Medium: provider has released 1 to 10% of its total severely handicapped population to less sheltered settings.
-- High: provider has released more than 10% of its severely handicapped population to less sheltered settings.

18. Evidence that Clients Receive Educational/Habilitative Services After Discharge from the Provider: The provider has released clients into settings where they receive some form of educational and habilitative services.

Quality Criteria
-- Low: less than 50% of the clients released are receiving educational or habilitative services.
-- Medium: between 50% and 74% of the clients released are receiving educational or habilitative services.
-- High: more than 75% of the clients released are receiving educational or habilitative services.

As with the construction of the entire quality model, decisions on the relative cutoffs and weights among the six major service areas were based upon the judgment and philosophy of the Abt Associates project directors in consultation with OPBE staff. The project directors wish to make clear that the quality model was constructed based upon an absolute rather than an empirical standard of what constitutes high, medium, or low quality service for severely handicapped children and youth. Therefore, it is likely that some readers may disagree with various aspects of the model.

The six major service areas (or "aggregate" quality indices) which constitute the quality model are shown in Table 2-5 following. The six aggregate variables were constructed using cluster of items drawn from the study instruments as described above.

Table 2-5

Aggregate Quality Variables

A. Educational and habilitative opportunities

B. Staff-Client Interactions

C. Parent Involvement

D. Humanization of Institutional Setting

E. Extent of Training and Evaluation

F. Client Movement

The aggregate quality indices were compiled by summing their component items. The particular items that constituted each of the six quality categories were described on pp. 27-32. In cases where data for a particular provider was missing or incomplete, a missing value was assigned to the quality variable for that provider. The average number of missing cases for the 18 quality indices was 1.5. (Much of this was due to the fact that one provider did not permit observations. Consequently, this provider lacked data for the seven quality indices which required observation data.)

2.5 Limitations of the Data

In any research study, a compromise between practicality, the infinite curiosity of the investigators, and the resources available to the study, must be reached. While this can generally be accomplished without sacrificing the methodological integrity and rigor of a project, some limitation on the generalizability of the study's findings often results.

Two factors relating to the selection of providers contribute to limiting the generalizability of the study results. These are: first, the lack of a precisely defined universe from which to sample; and second, the self-selection biases of the selection procedures utilized. Although the selected sites were drawn from a 5,000 provider population compiled from two different sources, the population of interest (providers serving severely handicapped children and youth) was known to be somewhat smaller than this 5,000. However, it was not possible to determine if a specific provider was or was not a member

of this universe without obtaining additional data from a mail survey. Since the response rate to this survey was only 36% of the 5,000, all non-responding providers remain unclassified.

The initial mail survey developed a list of providers from which the 100 participants were selected. Had the sites been selected from this list in a strictly probabilistic manner, it would have been justifiable to make statistical generalizations to this population. However, the resultant population may be defined simply as "respondents to the mail questionnaire" and, therefore, no statistical generalizations shall be made throughout this report.

Because participation in the study was strictly voluntary on the part of providers, it can be asserted that the sample was self-selected. This self-selection took place at several points: first, unwilling institutions did not respond to the initial mail questionnaire; later, institutions which had responded to the questionnaire declined to participate. It can be hypothesized then that those institutions which did not respond to the initial questionnaire or which later declined to participate are those which perceive themselves as providing low quality care; therefore, the sample of 100 providers may well be biased toward providers who perceive that they are providing higher quality care than would actually exist in an unbiased sample.

A similar bias may be inherent in the procedures used to select observation settings. Although the types of settings to be observed were specified by the project directors both by letter and telephone prior to the field visits, selection of settings was left up to the provider director, particularly in cases where there were too many settings to be observed within the specified time period. In addition, provider staff in the observation settings were informed of the observations prior to the visit. This advance notice could conceivably have led some staff to plan atypical activities and to provide "better" quality care to the clients during the observations. Finally, clients were aware of the observer's presence in the settings. It is unclear, however, whether this potential for reactiveness biased the observation outcomes in any way.

Another source of bias lies in the fact that many of the data collected were self-reported on the part of provider representatives

(directors, staff, etc.). Since questions were asked that could easily have been misrepresented to make the provider look better than it actually was, caution must again be taken in evaluating the data. However, cost data were obtained primarily from audited provider records (rather than from responses by individuals), therefore, it was assumed that these data are relatively accurate and unbiased.

One last source of ambiguity in interpreting the research results stems from the fact that some clients in the 100 selected providers (and in the observation settings within the providers) were not "severely" handicapped children or youth. In fact, over 60% of the observation settings had non-severely handicapped clients in them. This condition is unavoidable since most institutions do not presently segregate clients by severity of handicap. However, this heterogeneity may lead to a number of problems. First, some of the clients in observation settings were not severely handicapped, which could have affected the nature of staff-client interactions in that setting. Second, certain types of providers (most notably those serving emotionally disturbed clients) had a smaller percentage of severely handicapped clients than other types. Finally, the fact that providers were heterogeneous raises the possibility that responses to our questions may have covered the larger client population rather than only the severely handicapped clients. Although explicit instructions were given to restrict responses to the client population of interest, we have no guarantee that this was in fact accomplished.

3.0 CHARACTERISTICS OF PROVIDERS AND CLIENTS

In this chapter, we shall discuss some highlights of the demographic and programmatic characteristics of the 100 providers of services to severely handicapped children and youth, their staff and their clients.

Only the most interesting and programmatically relevant findings will be presented in this chapter. The reader wishing more detail on particular variables or the research in general is referred to the other volumes of this study:

Volume 4: Case Studies of Provider Services contains extensive prose discussions of most of the variables that are addressed in this section. Volume 4 discusses providers grouped according to the primary handicapping condition they serve.

Appendix A of the present volume includes 22 sets of tables presenting provider characteristics in great detail. The important substance of these tables is discussed fully in the text, but more detail is presented in Appendix A. Appendix A describes the 100 providers in terms of a number of dependent variables, broken down by four primary independent variables:

- Provider service type (day, residential or mixed);
- Size of severely handicapped population in the provider (fewer than 10, 10 to 50, 51 to 200, and more than 200 severely handicapped clients);
- Provider client type (mentally retarded, emotionally disturbed, deaf-blind, multiply handicapped, and mixed handicapping conditions); and
- Control (public or private).

A two-way breakdown of each dependent variable by provider service type and client type is also included in Appendix A.

3.1 Description of the Providers

The focus of the present study is a group of 100 facilities that provide day and/or residential services to severely handicapped children and youth (age 21 and under). These providers may serve other client groups as well, either in separate units of the provider or integrated with members of the target population. The sampling procedure

which yielded this group of providers has been described in Chapter 2. Here will be presented the results of that sampling in terms of provider characteristics.

Table 2-3 presents the original breakdown of the sample of providers. While it was our intention to select approximately equal size cells, the distribution of providers responding to the first mail questionnaire made this impossible. For example, no large (over 200 clients) day providers were selected. Also, few appropriate facilities for deaf-blind clients were identified; therefore, only eight such providers were included in the sample, and one of these was reclassified following data collection. Several other reclassifications resulted in further imbalances in the distribution of the sample on four primary variables. The final status of the sample is described by Tables A-1a through A-1d in Appendix A. Again, we see that the cells for deaf-blind providers were the hardest to fill, since only seven such providers were in the final sample. None of these were mixed (day/residential) providers, and none were large (over 200 clients); also, none were day providers serving between 10-50 clients. Overall, we were able to obtain a balance between publicly and privately controlled providers. However, according to the original classification of the sample (Table 2-3), the large residential cell (over 200 clients) only had one private provider (out of 14) while the cell containing day providers serving 10-50 clients had 11 privately controlled providers (out of 15).

Out of the 100 providers, 43 were located in areas classified as "suburban" by our field staff members who visited the sites (Table A-1e). This may reflect either the fact that many providers serving urban, inner-city client populations are located in suburban locations (since space is often cheaper and easier to obtain) or a tendency on the part of field staff to classify as "suburban" any providers that were not in <u>obviously</u> urban or rural environments. We find the remaining providers approximately equally distributed between urban (29) and rural (28), with relatively more day providers being located in urban areas and more residential providers being rural.

One additional issue explored in our survey of providers was the nature of their service mandates (Table A-2). That is, what types and

levels of disability are they designed (and perhaps required) to serve? Of course, most providers had mandates to serve the type of client that represented their primary client group. However, the range of mandated disabilities varied. Providers serving emotionally disturbed clients were very specialized and rarely had mandates to serve other types of disability. While providers serving deaf-blind clients often had mandates to serve other disability groups, the reverse was not generally true. That is, few other types of institutions had mandates to serve deaf-blind clients.

The severity of disability mandates was also studied. Overall, 65% of the providers were specifically mandated to serve severely handicapped clients. Again, providers serving emotionally disturbed clients often specialized; only 19% of such providers had a mandate to serve all severity levels. In contrast, providers to mentally retarded clients were mandated to serve all severity levels in 50% of the cases, and had a specific mandate for the severely handicapped 90% of the time. In general, the smallest providers (fewer than 10 severely handicapped clients) were not specifically mandated to serve the severely handicapped (only 40% had such a mandate). However, whether mandated to serve severely handicapped clients or not, every one of the 100 providers studied was in fact serving such clients. Specific mandate and actual enrollment of clients, both in terms of severity and type of disability, do not appear to be perfectly related. There appears to be a high degree of flexibility in client admission.

3.2 Client Characteristics

A total of 8,615 severely handicapped clients were enrolled in the 100 providers visited in the course of this study. Of these, 1,688 clients were located in the 43 day providers, 3,481 clients were located in the 38 residential providers and 3,446 clients were located in the 19 mixed providers.

The total institutional population of the 100 providers was approximately two times larger than the severely handicapped children and youth population since not all providers serve such clients exclusively. While the average number of severely handicapped clients was about 86, the average total population of an institution was approximately 162.

Day providers were, on the average, quite a bit smaller than either residential or mixed providers; their total population was only 71 compared to 218 and 268 for mixed and the average enrollment size by handicapping condition ranges from 39 clients in providers serving primarily the deaf-blind to 113 clients in providers serving clients with various disabilities (Table A-3). Table 3-1 summarizes the total and average enrollment of severely handicapped clients by provider client type and provider service type.

Publicly controlled providers were much larger than privately controlled ones, both in terms of total population and the number of severely handicapped clients served. The average public provider enrolled 236 clients in total, 121 (51%) of which were severely handicapped by our definition. Private providers averaged 99 total clients, of whom 56 (57%) were severely handicapped (Table A-3).

Over all providers, 63% of the severely handicapped clients were male, although 78% of the clients of providers serving primarily emotionally disturbed persons were male (Table A-4a).

Investigations of the ethnicity of clients show that 80% of all severely handicapped clients in these providers were white, 14% black and 6% other minority. This differential is maintained except in two situations. First, the proportion of minority clients was greater in larger providers (over 50) than in smaller ones (under 50). Approximately 14% of the clients in the smaller group were minority as compared to 29% in the larger group. Another interesting finding is that 26% of the clients of deaf-blind providers were black (Table A-4a).

Clients enrolled in day programs tend to remain enrolled approximately 4.5 years while clients of residential programs remain for about 5.4 years. Major deviations from this are providers serving primarily emotionally disturbed clients, where the average enrollment period was two years for residential programs and 2.3 years for day programs. We may conclude that the enrollment period for emotionally disturbed clients is significantly shorter than that for other handicapping conditions. We also note that the average enrollment period for clients in residential deaf-blind programs was 9.7 years while that for day deaf-blind programs was 4.5 years, exactly the average for all day programs (Table A-4a).

Table 3-1

Number of Severely Handicapped Clients
by Provider Client Type by Provider Service Type

Provider Client Type	Provider Service Type			
	Day	Residential	Mixed	Total
Mentally Retarded	N=10 n=360 ($\bar{x}$=36)	N=5 n=190 ($\bar{x}$=38)	N=2 n=1024 ($\bar{x}$=512)	N=17 n=1574 ($\bar{x}$=93)
Emotionally Disturbed	N=8 n=224 ($\bar{x}$=28)	N=9 n=657 ($\bar{x}$=73)	N=4 n=220 ($\bar{x}$=55)	N=21 n=1101 ($\bar{x}$=52)
Deaf-Blind	N=3 n=126 ($\bar{x}$=42)	N=4 n=148 ($\bar{x}$=37)	0	N=7 n=274 ($\bar{x}$=39)
Multiply Handicapped	N=10 n=570 ($\bar{x}$=57)	N=6 n=1002 ($\bar{x}$=167)	N=8 n=592 ($\bar{x}$=74)	N=24 n=2164 ($\bar{x}$=90)
Mixed	N=12 n=408 ($\bar{x}$=34)	N=14 n=1484 ($\bar{x}$=106)	N=5 n=1610 ($\bar{x}$=322)	N=31 n=3502 ($\bar{x}$=113)
Total	N=43 n=1688 ($\bar{x}$=39)	N=38 n=3481 ($\bar{x}$=92)	N=19 n=3446 ($\bar{x}$=181)	N=100 n=8615 ($\bar{x}$=86)

KEY:

N = Number of providers

n = Number of severely handicapped clients

$\bar{x}$ = Mean number of severely handicapped clients

3.3 Staff Characteristics

There were an average of .85 full-time equivalent staff per client served (based on a 40-hour work week) over all providers.* Attendants accounted for the largest proportion of this total, with .20 attendants per client. We also observed averages of .11 administrators and .15 support staff members per client, as well as .13 certified teachers and .10 non-certified teachers/aides. Other full-time equivalent averages per client ranged from .002 (psychiatrists and medical doctors) to .05 (therapists).

As might be expected, residential and mixed providers had significantly more staff per client than day providers in the categories of attendant (.37 and .25 vs. .02) and support staff (.22 and .27 vs. .04), and, on a smaller scale, in the categories of nurse, psychiatrist, and medical doctor. Very small providers employed more certified teachers than the average (.18 per client), and providers serving 10-50 clients had more non-certified teachers (.14 per client). Very large providers had high ratios in the categories of attendant (.30 per client), nurse (.09 per client vs. an overall average of .04) and medical doctor (.008 vs. .002 overall), possibly related to the fact that there were no day providers serving more than 200 clients.

Providers serving mentally retarded clients had a much lower ratio of .56 staff per client served; averages for all staff categories were lower among this group. Providers serving emotionally disturbed clients and deaf-blind populations had high numbers of staff per client served with .997 and 1.02 respectively. Providers to emotionally disturbed clients showed high staff:client ratios in the categories of therapist (.12 staff per client vs. .05 overall), social worker (.05 staff per client vs. .02 for all providers), and psychiatrist (.006 staff per client vs. .002 overall). Numbers of staff per client in the categories of certified teacher, non-certified teacher/aide, administrator, and "other" were also higher than average in providers serving emotionally disturbed clients. Among providers

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*Note: Due to the fact that staff in some providers worked half-time with severely handicapped clients, staff hours were converted to a full-time equivalent based on a 40-hour work week.

serving deaf-blind clients, very high staff:client averages existed in the categories of certified teacher (.26), non-certified teacher/aide (.21), and attendant (.31), while ratios were below average for all other staff categories.

Public providers had more staff per client than did private providers in three categories: nurse (.06 public vs. .02 private), support staff (.22 vs. .09), and attendant (.24 vs. .16). Over all staff categories, public providers had an average of .98 staff members per client as compared to .70 for private providers.

Demographically, 80% of provider staff members were white, exactly the proportion observed for clients. Again, larger providers had a larger proportion of minority staff than smaller ones. Although there was little difference in the characteristics of the clients in providers serving emotionally disturbed populations, we found 91% of their staff members to be white. Public providers had more minority staff than private providers (26% vs. 15%). Only 23% of the staff members were male, with the largest concentration of male staff members in large providers, where they may serve as attendants and support staff, and in providers serving emotionally disturbed clients, where a higher number of professional staff was noted (Table A-5).

3.4 Provider Services

A primary focus of the present study was the type of services offered by the providers to their severely handicapped clients. In all, seven types of services were investigated. Table 3-2, following, is a summary of our findings in terms of service offerings:

Table 3-2

Services Offered by Percent of Providers Offering Each Service

Service	Percent of Providers Offering Service
Educational/Habilitative	94%
Basic Care	89%
Diagnosis and Referral	84%
Family and Community	82%
Administration	79%
Support	77%
Medical	51%

Educational and basic care services were the most widely offered while medical care was the least widely offered across the 100 providers. Generally, medical services were secured from a source outside of the provider when they were necessary by providers not delivering such services themselves. Residential and mixed providers were more likely to offer medical care than day providers (55% and 58% vs. 44%); very large institutions were more likely to deliver them than very small ones (77% vs. 33%). Family and community services were more likely to be provided by day than residential providers, while the reverse was true of support services. In general, a smaller percentage of the very small providers offered any of the types of service; the exceptions are educational/habilitative and basic care services. An explanation is that providers serving fewer clients are restricted in the range of services they are able to offer, while larger institutions have the necessary base to deliver a wide range of services. Similarly, a smaller percentage of providers serving mentally retarded clients, compared to other provider client types, offered a wide range of services (Table A-6).

We also looked at educational/habilitative services as an aggregate category including not only the original educational/habilitative services category but also diagnosis and referral, and family and community services (Table 11). Across the 100 providers, we found that 99% offered educational/habilitative services of some sort to their clients. In most categories of providers, every provider offered such services. The exceptions were residential providers, among provider service types; providers serving 10-50 clients, among providers grouped by size; and providers serving primarily multihandicapped clients, among provider client types. Even these types of providers offered educational/habilitative services in the vast majority of cases. The least likely providers to offer these services were day providers serving deaf-blind clients; only 77% of these providers offered such services.

One final aspect of services (especially educational services) is follow-up. While 97% of the clients enrolled in the 100 providers received educational and habilitative services (Table A-7), only 77% of those discharged were estimated by provider staff to be receiving such services after release (Table A-8). Of these clients, the largest

number were receiving educational services from local schools (suggesting that these clients were living in a natural or foster home), while the remainder were served primarily by special day programs and residential facilities similar in nature to those studied. Clients released from day providers were more likely than those released from residential providers to receive their educational services in schools, while those discharged from residential providers were more likely to receive these services in residential care settings.

3.5 Admission and Discharge

For the 100 providers studied, an average of 43 client applications were received over an eleven-month period starting July 1, 1973. The average number of applications in residential and mixed (day/residential) providers were somewhat higher than for day providers. Numbers of applicants vary directly with provider size, ranging from 12 in the smallest providers to 90 in the largest.

Seventy-one percent of the applicants across all providers were accepted as clients. Acceptances vary with type of provider from 54% in residential providers to 83% in day providers. Providers serving multiply handicapped clients had an exceptionally high rate of acceptance (97%), while providers of services to emotionally disturbed clients had a low acceptance rate (48%). Public providers showed an average acceptance rate of 85%, while private providers accepted only 60% of their applicants.

The average waiting period for admission into day programs in the 100 providers studied was just over three months. This period was much longer (six months) for day programs in mixed providers serving more than 200 clients, and shorter (1.8 months) in providers serving 10-50 clients. Residential programs had an average waiting period of 7.7 months, more than twice the waiting period for day programs. This difference may be related to the longer enrollment period of residential clients and to the definite capacity limits of residential facilities. Variability in the average waiting period was much greater for residential programs than for day programs. In the smallest and the largest providers, tha average waiting periods were 3.3 months and 2.8 months respectively, while in providers serving 51-200 and those serving 10-50 clients, the average waiting periods were 11.1 months and 14.2 months respectively. The waiting

period for applicants to residential providers serving multiply handicapped clients was exceptionally long (18.5 months). Applicants to public residential programs wait an average of 11.2 months for admission while applicants to residential programs in private providers wait an average of 4.0 months.

An average of 26 clients per provider were discharged during an eleven-month period from July 1, 1973 to June 1, 1974. However, providers serving deaf-blind clients released an average of only one client per provider during the eleven-month period while providers serving emotionally disturbed clients discharged an average of 54. For day providers, an average of 10 clients were discharged.

The following tables summarize the reasons given for client discharge and their placement after leaving the providers studied. Because of the different nature of day and residential programs, separate data were collected for each group. Table 3-3 presents the reported reasons for client discharge from the providers. Table 3-4 summarizes the placement of clients after their release.

The primary reason given for discharge of both day and residential clients was improvement in the client's functioning level. For day providers, the next most common reason is removal by the client's family. In residential programs, death or deterioration of functioning are the next most common reasons. For both day and residential programs, functional improvement was not an important discharge reason for small (less than 10) providers, while functional deterioration was. A description of their placement can be found in Table 3-4.

Client age as a discharge factor applied most exclusively to day programs for emotionally disturbed clients and to residential programs for multiply handicapped clients. Functional deterioration or improvement were both very common reasons for discharge from providers serving deaf-blind clients, suggesting that these providers were equipped to serve a relatively narrow range of severity. Family removal of the client was not cited as a reason for release in any of the residential providers serving deaf-blind clients.

Both day and residential clients were most likely to be discharged to their natural homes rather than to any other living situation, with

Table 3-3

Percent of Clients Discharged
by Reason for Discharge by Program Type

Reason for Discharge	Day Programs	Residential Programs
Client Functioning Level Improved	36%	43%
Client Functioning Level Deteriorated	8%	12%
Client Died	7%	11%
Client Removed by Family	14%	9%
Client Reached Maximum Age	5%	8%
Funding of Provider Reduced	2%	2%
Other Reasons	28%	15%

Table 3-4

Percent of Clients Discharged
by Subsequent Placement by Program Type

Subsequent Placement	Day Program	Residential Program
At Home	75%	38%
Institution	12%	22%
Foster Home	4%	12%
Group Home	2%	12%
Nursing Home	0.3%	7%
Different Part of Same Facility	3%	1%
Other	3%	8%

75% of discharged day clients and 38% of residential clients released to such settings. The next most likely placement for both groups was other institutions, accounting for 12% of day clients and 22% of residential. Alternative community placements (foster or group homes) together accounted for 24% of residential releases but only 6% of released day clients.

The above trends are fairly consistent over providers, although some variation was noted. Day deaf-blind clients were far more likely to be released to another institution than to a community setting (natural, foster, or group home). However, residential deaf-blind clients were more likely to be released to their parents than were any other type of client (84%). Public providers appeared more likely to release their clients (both day and residential) to alternative community settings than were private providers, perhaps because public institutions have more ready access to these types of facilities.

3.6 Other Provider Characteristics

This section describes some other provider characteristics. These have been selected either because of their policy relevance or because they are hypothesized to relate to provider cost or quality and, consequently, will be investigated further in Chapters 5 and 6.

3.6.1 Formal Evaluation

Sixty-three percent of the providers studied were formally evaluated within the last five years, usually by state or federal agencies and/or by the provider's own staff. The occurrence of formal evaluation was directly related to provider size, going from 46% of the smallest providers to 100% of the largest. Public or private sponsorship did not appear to affect the incidence of formal evaluation.

Eighty-two percent of the providers which had been evaluated used results of the evaluations to develop instructional programs. Evaluation results were used by 53% of the providers to measure client progress and by 40% of the providers to evaluate program components. The most interesting variation in the use of results was among providers serving different client groups. Where 100% of the providers serving deaf-blind clients used evaluation results to develop instructional programs, only 64% of the providers serving a mentally retarded population put evaluation results to

measure client progress, while only 33% of the providers to deaf-blind clients did so. Providers serving emotionally disturbed clients were those most likely to use results to evaluate program components, and this group was also well above average in the application of other possible uses of evaluation (93% used results to develop instructional programs and 59% to measure client progress.)

3.6.2 Formal Client Assessment

Client assessment was a very prevalent practice among the providers studied, with 94% of all providers conducting some type of formal assessment. This tendency went across all types of providers, except those serving deaf-blind clients (where only 71% of the providers conducted client assessments), which may be a function of the difficulty of testing this client population.

Individualized and standard assessment techniques were about equally distributed, with 48% of all providers using the same assessment procedures for all clients. Again, providers serving deaf-blind clients differed from this general trend: 70% of these providers used the same assessment procedures for all clients.

Self-sufficiency was assessed by 94% of the providers, while intellectual functioning was assessed by only 83%. Variations from this trend are noteworthy. Providers serving emotionally disturbed clients were the least likely to assess self-sufficiency, probably because this is not always a significant part of the disability of emotionally disturbed clients. Likewise, only 67% of the providers serving deaf-blind clients assessed intellectual functioning. This could be a result of either the fact that standardized intelligence tests would be very difficult to administer to such persons or to the possibility that intellectual functioning as a general concept is not a central part of these clients' disabilities. Very large (over 200) providers assessed intelligence in 98% of the cases. (This fact, together with the observation that they were also very likely to use the same assessment procedures for all clients, suggests that the size of these institutions may make reliance on standard procedures very attractive.)

3.6.3 Parent Involvement

Directors of 95% of the providers studied indicated that there was some parent involvement in provider programs. This involvement most often took the form of discussions with staff about children, participation in parents' groups or other provider-affiliated organizations, parent education sessions, and development of training or instructional programs for children. The existence of parent involvement was directly related to provider size (ranging from 88% among the smallest to 100% among the two largest groups of providers). An average of 46% of the parents of clients were actively involved in the planning or delivery of services to their children. This average was somewhat higher for day providers than for residential providers. Size appears to be related to parent activity in service planning/delivery: among providers serving 10-50 clients, an average of 60% of the parents participated in service planning/delivery, while in providers serving more than 200 clients, only 25% assisted. However, many large providers were located in isolated rural areas, thus inhibiting parental involvement. Sixty-one percent of the parents of clients enrolled in providers serving emotionally disturbed children and youth were involved in service planning or delivery.

3.6.4 Parent and Client Visiting

The majority of clients enrolled in the residential programs studied were visited by their families at least on some occasions, as reported by the provider directors. In all, 43% of the clients were reported to be visited by their families more than once a month and 33% were visited less than once a month. However, it was reported that 24% of all clients in residential programs were never visited by their families. The least amount of visitation was observed in providers serving over 200 severely handicapped clients (only 28% of their residential clients were visited more than once a month while 40% were never visited). Providers serving primarily emotionally disturbed or deaf-blind client populations appeared to have the most visiting; those serving multiply handicapped or mixed client populations had the least amount of parent visitation. Public providers had only slightly less visiting by families than private providers.

One alternative to parents visiting an institutionalized severely handicapped child is to have the child make visits to his or her home. In the residential programs studied, the observed frequency of home visits (again, as reported by the provider directors) followed a pattern very similar to that described above for parent visiting. Forty percent of the residential clients made home visits more than once a month while 27% never made such visits. Residential clients from mixed providers made considerably more home visits than those enrolled in purely residential providers. Again, very large providers had less home visiting and the differences observed according to the primary client population served remain as described above.

3.6.5 Changes in Providers

More than two-thirds of the providers studied indicated that significant change had occurred over the past five years in: numbers of provider staff (79% indicated increases); enrollment size (mostly increases in day providers, decreases in residential); educational approach (usually upgrading, use of more/better materials, new techniques); funding source or level (increases in most cases, with more public and less private support); and range of services offered (expanded and more comprehensive). Fewer providers had changed in physical size (enlargement); enrollment capacity (more increases than decreases indicated); severity and types of handicaps served (most providers serving more severely and more multiply-handicapped clients); and discharge criteria (usually better defined criteria, greater tendency to discharge if alternative placements are available). In general, providers serving more than 50 clients had changed more often in most of the areas mentioned. In groups of providers by primary handicapping condition served, change had generally occurred at rates similar to overall rates. Exceptions exist among providers serving mentally retarded clients, 94% of which had changed in educational approach (expansion of techniques and programs); among providers serving emotionally disturbed clients, where 75% had increased in physical facility size; and among providers serving deaf-blind clients, 100% of which had increased the number of provider staff. Private providers had increased their funding levels with proportionately more public support having been obtained.

3.7 Quality

The primary measure of overall provider quality used in the present study was a variable indicating each provider's quality score as a percent of the maximum possible score that could have been earned by that provider (see Section 2.4.9). For all 100 providers studied, the mean quality score observed was 63%, with no provider scoring lower than 33% or higher than 87%.

Day providers were found to be of slightly higher quality than residential providers (65% vs. 59%), while mixed providers averaged 67%. The number of severely handicapped clients enrolled in a provider appeared to be related to quality, with the very smallest (fewer than 10 clients) having the lowest quality. It is interesting to note that this relationship was not strictly linear; the largest providers (serving more than 200 severely handicapped clients) had a slightly lower quality score than those serving 51-200 clients. This suggests that the optimal number of severely handicapped clients served by a given provider may lie somewhere between 50 and 200.

Providers serving primarily emotionally disturbed clients were observed to have the highest level of quality; all other providers (grouped by client population) were of approximately equal quality. We observed no difference in the level of quality achieved by public as opposed to private providers.

Residential providers serving primarily mentally retarded clients were found to have the lowest level of quality of any such type-client population group (46%), while mixed (day/residential) providers serving mentally retarded clients had the highest average quality (75%). Among day providers, those serving primarily deaf-blind clients were the lowest in quality, while day providers serving clients who had all other handicapping conditions were about equal in quality. For residential providers, those serving primarily mentally retarded clients had the lowest level of quality while those whose target population was either emotionally disturbed or deaf-blind clients had the highest.

The total quality index was composed of six variables including educational and habilitative opportunities; staff-client interactions;

parent involvement; humanization of institutional setting; extent of training and evaluation; and client movement. Important variations in the level of quality observed on these scales are that day providers are uniformly higher than residential providers on all quality components except client movement out of the provider. While provider size was positively related to overall quality, smaller providers were observed to be of higher quality in terms of educational opportunities, staff-client interaction (although this difference was small), and humanization. The largest providers (over 200 clients) had the lowest quality score for three components (educational opportunities, staff-client interaction and humanization); however they achieved the highest levels on the extent of training and evaluation.

With regard to the primary client population served by the providers, those serving deaf-blind clients had the highest levels of educational opportunity, staff-client interaction and training and evaluation. However, these providers were dramatically lower than others in terms of client movement out of the provider. Providers serving primarily emotionally disturbed clients were usually above average on each quality component; other types of providers were generally at or near the average. Public and private providers were again observed to have no important differences in quality for any of the six subscales.

To summarize our findings about quality, we shall make several generalizations. The discussions contained in Chapters 5 and 6 will expand upon these findings and investigate the relationship of other variables to provider quality. Our quality findings are:

- Day providers were of higher quality than residential or mixed providers.
- Larger providers were of higher quality than smaller providers, with the optimal number of clients being 51-200.
- Providers serving primarily emotionally disturbed clients were of higher quality than all other providers.
- Public and private providers were virtually identical in quality.

These bivariate relationships will be further explicated by the measures of association discussed in Chapter 6.

4.0 ANALYSES AND RESULTS: OBSERVATION SCHEDULE

The Observation Schedule and its analysis plan were designed for two purposes:

1) to describe characteristics of the settings within the 100 providers; and

2) to determine common occurrences of types of behavior of clients, of staff, and between clients and staff.

A copy of the complete Observation Schedule was included in Chapter 2 of this volume (pp. 24-25).

The two objectives for the Observation Schedule were met by the collection of two different types of data. The coversheet of the Observation Schedule was used to collect descriptive information about the settings in which structured observation took place. Such data as the type of setting observed (classroom, dining facility, recreation room, etc.), number of staff and clients, and general appearance of the setting were noted. The second type of information collected with this form was a series of structured observations of the characteristics of staff-client interaction in the settings. The transactions between individuals in the setting, if any occurred, were recorded, along with information as to the frequency of each type of interaction and the person initiating it. As discussed in Chapter 2, the structured observation approach used in the present study was adapted from a procedure developed and tested by Dr. Michael Klaber for his study, Retardates in Residence: A Study of Institutions (1967). These findings are discussed in Section 4.1.

Because of the tremendous amount of raw data generated by interaction analysis, a procedure for reducing this amount to a far smaller and more manageable number of variables was implemented. A "classical" factor analysis of the interaction variables was performed so that factor scores describing the most important factors could be computed and analyzed. The details of this procedure are presented in Section 4.2.

A total of 1151 observation settings were visited in the 99 providers in which observation data were collected. (One provider refused to allow use of the Observation Schedule within its settings.) One set of

setting description data and three sets of staff-client interaction data (for a total of 3453 sets of the latter) were recorded for each of the 1151 settings. Table 4-1 shows the variability in the number of settings observed within the 99 providers by primary type of handicapping condition served and by type of provider (day, residential or mixed). Although there is some imbalance across the various types of conditions and providers, the ratio between the number of providers of a particular type and the number of settings observed within that type remains fairly consistent. The observation settings were selected from those where the majority of severely handicapped clients were located during various times of the day. The distribution of the number of sets of setting description data varied from provider to provider, depending on the number of settings within the provider which serviced severely handicapped clients and the amount of time the observers spent in each setting. In some providers multiple observations were made of the same location at different times during the day. This was necessary in situations where fewer than eight different appropriate locations existed in the provider.

4.1 Characteristics of Settings

A series of tables summarizing the data collected by the Observation Coversheet are contained in Appendix B of this volume. As in Chapter 3, the following section will highlight the important results contained in those tables. Readers wishing more detail are referred to Appendix B or to the discussion of the observation findings in Volume IV: Case Studies of Provider Services.

The settings observed in the 99 providers were generally homogeneous with respect to the concentration of severely handicapped clients. Overall, 62% of the settings observed had 100% severely handicapped clients in them, with residential providers having slightly more homogeneous settings. At the opposite extreme, 10.5% of the settings observed had 20% or fewer severely handicapped clients in them.

The highest proportion of observations in all types of providers were conducted in classrooms. Seventy percent of observations in day providers were made in classrooms, while only 51% and 32% of the observations were made in classrooms at mixed and residential providers, respectively. Over all providers, living or day rooms, gyms or auditoriums, and dining

Table 4-1
Distribution of Observed Settings
Within Each of the 99 Providers

No. of Settings Observed Per Provider	Total No. of Providers	No. of Providers of Services By Handicapping Condition					No. of Providers of Services by Type of Provider		
		MR	ED	DB	MH	MIX	Day	Residential	Mixed
8	1					1	1		
9	1				1			1	
10	19	2	4	2	3	8	11	5	3
11	22	6	5	3	3	5	7	11	4
12	36	4	8	2	11	11	17	12	7
13	14	4	2		4	4	4	6	4
14	4	1	1		1	1	2	1	1
15	1					1		1	
16	0								
17	1				1			1	
Total No. of Settings	1151	200	231	77	287	356	479	448	224

rooms or cafeterias were the next most frequently observed settings. The type of activity observed in the settings was educational in nature in 34% of the observations. Recreational activities were the next most frequently observed. While the general observation of more educational activity was found in all three types of providers (day, residential and mixed), a much lower occurrence of this activity type was observed in residential providers (23% of the observations vs. 39% and 35%); moreover, the incidence of no definable activity at all was much greater in residential providers (22% of the observations vs. 3% and 13%).

The general activity level in the settings was observed to be moderate in 49% of the cases, with the remaining settings about equally divided between high and low levels of activity. Residential providers tended to have more low activity settings while day providers had more high activity ones. Both groups had about the same number of moderate activity level settings.

Most of the clients observed in the 1151 settings were not confined to a bed or crib. Overall, less than 7% of the settings had any clients so confined.

The great majority of observation settings included both male and female clients (69%). Approximately 23% of the settings observed were all male and 8% were all female. The residential providers studied had a tendency to have more sex-segregated settings than did day providers.

Observers were asked to assess the degree of institutionalization* of each setting as being either high, moderate or low. Over all 1151 settings, 45% were judged to be of a low degree of institutionalization, 43% were moderate and the remaining 12% were highly institutional. Day providers had a far lower degree of institutionalization than did residential or mixed providers. Also, the condition of the interior of the building was considered "excellent" in over 77% of the settings and poor in only 1%. Noxious odors were present in about 4% of the settings and an antiseptic smell was noted in nearly 3%. Generally, day providers were more likely to have a neutral odor.

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*The degree to which the setting is "institutional" in atmosphere -- e.g., lacks comfortable furniture, drapes, rugs, homelike rhythm or routine to daily activities, etc.

Clients were adequately clothed in the vast majority of settings (96%), with inappropriate attire or partial undress noted in about 4% of the settings (all in residential providers). Sleeping conditions were reported to be "somewhat private" with rooms shared by a small number of clients, or "not private" (wards) in the majority of cases. Toilet facilities were very private in 62% of the settings and not private in 22%.

Operant conditioning techniques were found in 22% of the observations. Whereas the techniques were observed somewhat more frequently in day providers, they were not being generally employed in the settings observed.

There were an adequate amount of play materials in 74% of the settings observed. Day providers tended to have more settings so equipped while 14% of the settings in residential providers had no play materials at all. The materials found in the settings were in excellent condition in 61% of the observations. This was generally true across all types of providers, although materials were somewhat poorer in condition in residential providers. The quality of the materials was also assessed to be high in 63% of the observations. Again, the quality of materials observed was generally high while day and mixed providers had materials of somewhat better quality than residential providers.

4.2 Types of Behavior Observed

The Observation Schedule was used to collect information during three consecutive observations in a single setting. Each observation period produced two sets of information:

- Behaviors of an individual client and that client's interaction with staff and peers (individual behavior); and
- Behaviors of all other clients and their interaction with staff and peers (group behavior).

The ten variables dealing with inner-directed or setting-directed staff behaviors were included with both the individual data and the group data. Both sets of data, consisting of 62 variables each, were coded in intervals appropriate for aggregation to the provider level and for analyses using parametric statistical techniques.

The 3453 observations of both individual and group data were submitted to a classical factor analysis: that is, communality estimates were inserted into the diagonal of the correlation matrix (containing all 62 variables) before the principal axis extraction matrix was calculated. Initial factors were rotated to a varimax solution. The screen technique was used to determine an optimal number of factors to rotate. A solution containing seven factors, each with an eigenvalue greater than 1.0, was identified for the individual data. A similar solution for the group data consisted of eight factors with eigenvalues greater than 1.0. An incomplete factor score was calculated for all individual and group factors, using the procedure recommended by Horn (1965). Each variable which loaded at least ± 0.3 on a specific factor was identified; standard scores for each of the 3453 observations were calculated for those variables identified; and the standard scores of the variables were summed. The equation below summarizes the procedure:

Factor Score for Observation 1, Factor 1	=	Standard Score for Observation 1, Variable a	+	Standard Score for Observation 1, Variable b
	+	Standard Score for Observation 1, Variable c	+	...

The factor scores were then aggregated across all observations taken in a provider. Thus, seven individual and eight group factor scores for each of the 99 providers were calculated.

4.2.1 Individual Behavior

The seven factors which emerged from the 62 variables pertaining to individual clients are shown in Table 4-2, defined by the variables which loaded greater than ± 0.3. The amount of total variance in the set of 62 variables accounted for by each factor (its eigenvalue) is shown in this table as well.

Since the factor structure of the individual data was so similar to the factor structure for the group data, it was decided to utilize the set of data which represented the behaviors of more clients, i.e., the group data, in this report. Despite this decision to limit the discussion of the results to one set of data, parallel analyses were conducted.

Table 4-2

Factors Extracted from Individual Data

	Factor	Eigenvalue	Variable*	Loading	Name
1	Brief Staff-Client Interactions	.228	C-41	.95	Approaches Staff
			S-41	.82	Responds to Client's Approach
2	Mealtime Behaviors	.196	C-33	.81	Eats
			S-30	.60	Food
			S-37	.38	Feeds
			C-46	−.36	Plays with Toys
3	Sustained Staff-Client Interactions	.148	S-48	.84	Converses with Client
			C-51	.82	Converses with Staff
4	"Inner-directed" Client Behaviors	.131	C-31	.46	Inactive
			C-29	.42	Stereotyped Activity
			C-46	−.31	Plays with Toys
5	Staff-Client Interactions during Instruction	.120	S-47	.64	Instructs
			S-45	.63	Encourages
			S-49	.31	Demonstrates Affection
6	Staff-Client Interactions during Play	.090	S-51	.51	Plays with Client
			C-49	.43	Plays with Staff
7	Negative Behaviors	.087	S-54	.41	Scolds
			S-53	.34	Restrains
			S-46	.32	Warns

*Keyed to item number on Observation Schedule (p. 25);

C = Client, S = Staff.

4.2.2 Group Behavior

The eight factors which emerged from the 62 variables pertaining to the entire group of clients observed, defined by variables which loaded greater than ±0.3, are shown in Table 4-3.

Although it provided information similar to the individual factor solution, this group factor solution was selected for discussing the observed behaviors because it also contained an additional factor: Peer-Peer Interaction. The Mealtime Behaviors factor was dropped from further discussion because its appearance in the factor solution had been forced by the instructions to the data collection observers. They had been requested to observe during meal times to determine what else might be happening between clients and between clients and staff in addition to just eating (e.g., instructions on how to eat, playing, conversing, etc.). This factor contains none of these other possible types of interactions and was, therefore, dropped from the analysis since its existence was very likely an artifactual result of the set of variables analyzed, a common problem in any factor analysis.

The results of the analyses of the factor scores of the observed types of behaviors for providers serving clients with various types of handicapping conditions are described in Volume IV. Providers are described as above average or below average on each type of behavior based on whether the aggregated observations on the provider were one or more standard deviations above the mean (above average), between ±1 standard deviation from the mean (average), or one or more standard deviations below the mean (below average).

4.2.3 Analysis of Factor Scores

The factor score data were analyzed by type of provider. The results are summarized in Table 4-4. "Inner-directed Behaviors" were observed much less frequently in the day providers than in either the residential or mixed providers. "Staff-Client Interactions during Instructions," however, were more frequently observed in day providers. The remainder of the observed behaviors were fairly consistent across all types of providers.

Table 4-3

Factors Extracted from Group Data

	Factor	Eigenvalue	Variable	Loading	Name
1	"Inner-directed" Behaviors	.230	C-31	.62	Inactive
			C-29	.59	Stereotyped Activity
			C-27	.56	Whines
			C-30	.37	Moves without Apparent Purpose
			C-26	.35	Smiles, Laughs
			C-28	.30	Cries
2	Mealtime Behaviors	.190	S-30	.64	Food
			C-33	.63	Eats
			S-37	.53	Feeds
			C-46	.55	Plays with Toys
3	Brief Staff-Client Interactions	.138	C-41	.90	Approaches Staff
			S-41	.85	Responds to Client's Approach
4	Sustained Staff-Client Interactions	.118	S-48	.85	Converses
			C-51	.83	Converses with Staff
5	Peer-Peer Interactions	.093	C-40	.79	Approaches Peer
			C-42	.78	Responds to Peer
6	Interactions during Play	.087	S-51	.63	Plays
			C-49	.52	Plays with Staff
			C-48	.38	Plays with Peers
			C-52	.35	Participates in Group
			C-35	.31	Smiles, Laughs
7	Staff-Client Interactions during Instruction	.077	S-47	.64	Instructs
			S-45	.54	Encourages
			S-35	−.30	Supervision by Presence Only
8	Negative/ Aggressive Behaviors	.068	C-55	.39	Aggressive to Peer
			S-44	.36	Commands
			S-53	.30	Restrains

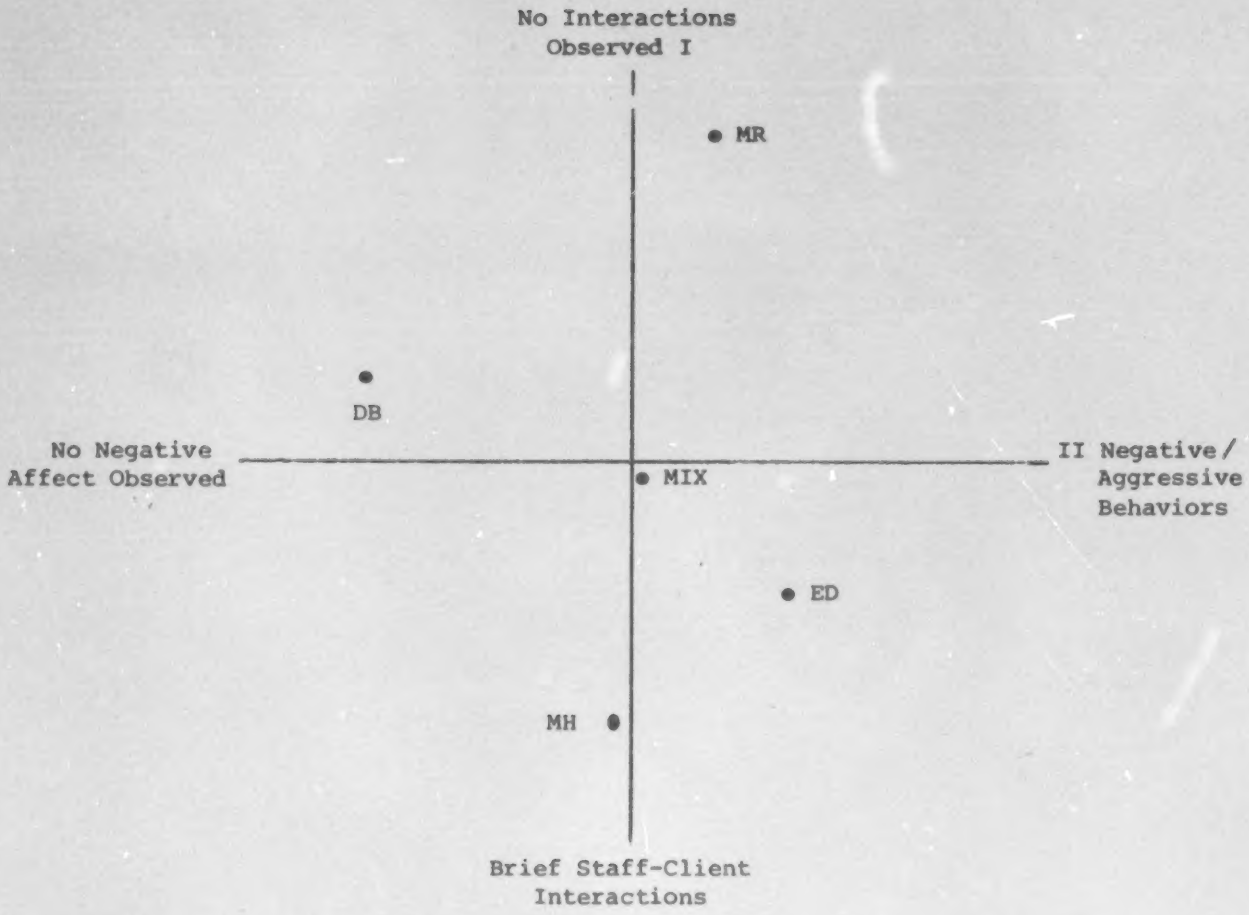
Table 4-4

Percent of Providers, by Type, Which Are Below Average, Average, and Above Average on the Types of Behaviors Observed

Type of Behavior Observed	Percent of Providers Below Average				Percent of Providers Average				Percent of Providers Above Average			
	Total	Day	Res.	Mixed	Total	Day	Res.	Mixed	Total	Day	Res.	Mixed
"Inner-directed" behaviors	42.4	52.4	34.2	36.8	30.3	30.9	29.0	31.6	27.3	16.7	36.8	31.6
Brief Staff-Client Interactions	0.0	0.0	0.0	0.0	93.9	95.2	94.7	89.5	6.1	4.8	5.3	10.5
Sustained Staff-Client Interactions	9.1	4.8	18.4	0.0	73.7	83.3	60.5	78.9	17.2	11.9	21.1	21.1
Peer-Peer Interactions	0.0	0.0	0.0	0.0	93.9	90.5	100.0	89.5	6.1	9.5	0.0	10.5
Interactions during Play	24.2	14.3	31.6	31.6	56.6	52.4	60.5	57.9	19.2	33.3	7.9	10.5
Staff-Client Interactions during Instruction	10.1	7.1	13.2	10.5	77.8	66.7	84.2	89.5	12.1	26.2	2.6	0.0
Negative/ Aggressive Behavior	0.0	0.0	0.0	0.0	91.9	92.9	94.7	84.2	8.1	7.1	5.3	15.8

A further analysis of the observed behaviors was conducted using discriminant function analysis. In an effort to determine which, if any, of the observed behaviors could be used to discriminate among the providers of services to clients with various types of handicapping conditions, a step-wise discriminant analysis was calculated. This procedure indicated that two observed behaviors, "Brief Staff-Client Interactions" and "Negative/Aggressive Behaviors" produced a significant degree of separation among the five types of providers. The Wilk's Lambda (a multivariate measure of the degree of separation ranging between 0.0 with perfect separation and 1.0 with perfect overlap) was found to be 0.77. A second discriminant analysis using only these two significant observed behaviors was conducted. Two discriminant variates were extracted. Table 4-5 shows the five types of providers plotted on these two discriminant functions. The figure indicates that "Negative/Aggressive Behavior" was observed most frequently in providers serving primarily mentally retarded or emotionally disturbed clients and somewhat less in providers serving primarily multiply handicapped clients. Little or none of this behavior was observed in providers serving deaf-blind clients. Relatively little "Brief Staff-Client Interaction" was observed in providers serving primarily mentally retarded or deaf-blind clients while some such interaction did occur in those providers serving a multiply handicapped or emotionally disturbed client population. The mixed client population providers represented a mean position for all other groups. Hence, these two observed behavior factors could be used to discriminate among the providers of services to various types of handicapped clients.

Table 4-5



KEY:

MR = Mentally Retarded
ED = Emotionally Disturbed
DB = Deaf-Blind
MH = Multiply Handicapped
MIX = Mixed

5.0 COSTS OF CARE FOR SEVERELY HANDICAPPED CHILDREN AND YOUTH

The purpose of this chapter is to discuss the costs of serving severely handicapped clients aged 21 and under in 95 of the providers visited.* The cost information is analyzed in terms of major provider characteristics. The first section of the chapter discusses the general methodological approach employed. The second section will discuss personnel expenditures for staff categories service areas by various provider types. The third section of the chapter will briefly examine the personnel expenditures from an institutional standpoint. The last two sections will discuss the non-personnel cost data obtained, and the major income and funding sources for the providers.

5.1 General Analytic Logic and Methodological Approach

The metric selected as most appropriate for describing the cost data in this study was the average standardized cost per childweek. This particular approach was selected for three important reasons. First, there was a need to standardize costs across providers. It was recognized at the outset of the cost analysis that the actual dollar costs of delivering educational services varied from provider to provider because of local, regional, and other economic factors independent of the quality or characteristics of the educational program being operated. For this reason, it was deemed appropriate for this study to express the amount of services delivered to children in terms of the resources applied rather than the exact local dollars spent. The measure of resource chosen for standardization was the person hour staff time.**

The second reason that this approach was chosen was that it allows a valid comparison between providers operating on different annual calendars. The providers within our sample operated programs for a variety of time periods. For example, most residential programs operated 52 weeks a year

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* Five of the 100 providers visited chose not to participate in the cost study.

** The major alternative to this approach commonly used involves adjusting dollar values for regional variation based on some regional economic index. This approach was not attractive to this study because of the observed variation between different types of providers within individual regions, in terms of salaries, fringe benefits, and overall cost operating patterns.

while many day programs followed the school calendar, operating approximately 39 weeks per year. To insure accuracy, data were collected in terms of the services delivered in an "average operating week" and all annualized salary costs were converted to the weekly and hourly rate for analysis purposes. The third and final reason that this approach was chosen was that a metric involving total cost per childweek was necessary to assess whether certain economies of scale were associated with providers of different sizes. A metric which neither allows for such comparisons nor standardizes differences away, was unacceptable.

The interpretation of the selected metric is straightforward. The average standardized cost per childweek represents the total personnel costs for an average child for a week within a given provider. In the following section we will describe the expenditure data parameters. In the subsequent section, we will describe the exact calculations employed.

5.1.1 The Expenditure Data Parameters*

Resource application data were collected for a matrix of seven service areas and twelve staff categories from each provider. The definition of these terms and the detail for all staff and service area categories were presented in Section 2.4 and the data collected are presented along a variety of basic dimensions in detail in Appendix A. The conduct of the cost analysis discussed in this chapter, and the regression analysis presented in the next chapter, necessitates an elaboration of some aspects of the collection procedures, as well as some changes in the basic parameters of the data. In the remainder of this section, these necessary details will be presented.

5.1.1.1 Allocation of Staff Time to Severely Handicapped Clients

In each provider, field staff interviewed service delivery staff and administrators to determine the person hours per week spent by each staff category in each service area. Where the client population included children not classified as severely handicapped, total staff time was reduced

*The terms "costs" and "expenditures" are precise and have very different technical meanings. This study is based on expenditure data and not cost data. Although the former term will be used primarily in coming chapters, the latter term will occasionally be utilized for grammatical reasons.

in proportion to the relative size of the severely handicapped population and the provider. This was done unless service delivery staff could demonstrate, to the satisfaction of the field interviewers, that their efforts were disproportionately directed to severely handicapped clients. The resulting resource data were expressed as a matrix of person hours devoted to severely handicapped clients by each of twelve staff categories in each of seven service areas. Since the data is being used to represent resource allocation, this procedure does not assume that the function of a particular staff category is the same between severely handicapped and other clients.

5.1.1.2 Aggregation of the Seven Service Areas to Three Aggregate Service Areas

Appendices C, D, and E of this volume present the cost data for the twelve staff categories by the seven service areas. Examination of these matrices by the study staff resulted in two important observations: (1) many of the 94 cells in the matrices represented less than one tenth of one percent of the total monies of a given matrix, (2) certain service area categories tended to co-vary across all provider types. These observations, plus the necessity for parsimony to facilitate the later regression analysis, led to the decision by study staff to aggregate the seven service areas into three aggregate service areas. The three aggregate service categories were constructed in the following manner:

- The educational/habilitative aggregate service area was created by summing expenditures for the educational/habilitative, family/community services, and diagnosis and referral service areas,
- The basic care aggregate service area was created by summing expenditures for the basic care, medical services, and support service areas; and
- The administration aggregate service area remained identical with the administration service area.

These three aggregate service area categories were developed from the data characteristics in view of the central research questions.

A similar aggregation of the twelve staff categories was considered by study staff. However, the varying application of staff resources to the service areas, plus the varied staff patterns observed accross providers, did not lend itself to aggregation.

5.1.1.3 Aggregation of Client Provider Types from 5 to 2

As was defined and discussed in Section 2.4, the providers studied fell into five categories vis-a-vis the client handicapped characteristics served. The primary client handicapped conditioning types were mentally retarded, emotionally disturbed, deaf-blind, and multiple-handicapped. Providers who served client populations with "mixed" handicaps formed an additional category. This "mixed" category is composed of providers where none of the four handicapping conditions constitutes a majority of the clients served.

As was the case with service areas, examination of the data and the primary research interests of this study led to an aggregation of the provider types. In this case, providers were classified into two types: those servicing primarily emotionally disturbed clients (N=19) and those primarily serving other than emotionally disturbed children (N=76). The reasons for aggregation to this particular classification center on observed variability in costs. Specifically, providers serving primarily emotionally disturbed clients exhibited expenditures that were in the aggregate generally higher than other provider types. Not only were the absolute costs highest, but also the staff patterns, and resource allocation patterns across service areas, were noticeably different for the servers of primarily emotionally disturbed clients. The introduction of this observed information into the analysis does not, in the opinion of the project directors, jeopardize the validity of the findings of the cost and regression analysis.

5.1.2 Calculation Procedures

Standard costs for labor were obtained by determining the average hourly salary for all staff of a given type in each provider and then averaging these provider averages across all providers in the study. Likewise, the fringe benefit rate for each provider was calculated and averaged over all providers. These cost data were collected in the spring of 1974.

The resource matrix*, containing hours per week, was converted into a matrix of standardized costs per week by multiplying the person hours per

*Details of this matrix can be found in Appendix A of this report.

week reported for a staff category by the standard costs for that staff category and then increasing that amount by the average fringe benefit rate (observed to be 10.5%).* For example, the average hourly salary for teachers was determined to be $4.32. If a provider delivered 80 person hours per week of teacher resources to severely handicapped children, the standardized cost per week for teachers in that provider would be:

- 80 hours X $4.32 per hour X 1.105 (fringe benefits) - $381.90
  This amount could be greater or less than the actual dollar cost for 80 hours of teacher time for a given provider.

In addition to the standardized cost per week, the standardized cost by staff type per childweek, was obtained by dividing the standardized cost per week by the number of severely handicapped clients served by the provider. In the above example, e.g., if twelve severely handicapped clients were served by the teachers, the standardized cost per childweek for the teachers would be $381.90 / 12 = $31.82. To achieve the total standardized cost per childweek, this process was repeated across all service areas for all staff categories.

5.1.3 Some Limitations of the Cost Analysis Approach

The approach described above permitted a meaningful analysis across providers of varying sizes and types that served a variety of client populations. However, one major limitation of this approach must be stressed. The approach we have chosen focuses on personnel costs expended by the providers. Hence, discussions of cost and the relationship of cost to quality and other variables do not address costs or services provided to severely handicapped children which are not reflected in the expenditures of the providers. For example, comparison of day and residential providers does not reflect the burden borne by families of severely handicapped children in day programs. Similarly, costs of a non-personnel nature are not reflected in the analysis.

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* The observed average fringe rate of 10.5% may strike the reader as somewhat low. However, the inclusion of small providers where many of the staff members were owners of the operation and withdrew monies from the company as opposed to salaries, and the inclusion of public providers that chose not to participate in the social security plan, led to this low observed average across the 100 providers. This particular observation again reinforces our earlier comments in this and other volumes concerning the relatively low average wage and remuneration of staff working with severely handicapped clients.

5.2 Overall Expenditures for Provider Service and Client Types

As Table 5-1 indicates, the average standardized cost per childweek across all 95 providers was $135.28. The expenditures vary considerably across types of providers as do the hours of service delivered by the providers. The discrepancy between the expenditures for day providers ($79.46) and residential providers ($202.30) is substantial. There is a smaller yet marked contrast between providers serving primarily emotionally disturbed clients ($168.64) and providers serving other than emotionally disturbed clients ($128.08). Clearly, the contrasts among the six cells indicate that the cost of care within a particular provider service type is less than for client handicapping condition types. However, the reader is again cautioned to recall that this table summarizes only the expenditure data available to this study and does not include various imputed burdens or non-personnel expenditures.*

5.2.1 Expenditures Within Providers on Aggregate Service Areas and Staff Categories

Within this section, we will discuss the observed allocation of staff resources across the three aggregate service areas by staff category. Specifically, Tables 5-2 through 5-7 present the average standardized cost per childweek by service area and staff category for each of the major provider types portrayed in Table 5-1.

5.2.1.1 Expenditures Across All Providers

Table 5-2 presents the average standardized cost per childweek for the aggregate service areas and staff categories across all 95 providers. The findings indicate that approximately one-half of all dollars are spent on educational/habilitative services ($66.52), and are provided by certified teachers, teacher aides, and therapists. The largest amount of staff expenditures is on certified teachers ($35.68). The expenditure on teachers becomes even larger relative to overall expenditures if the

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*The expenditure data collection procedures were discussed in Chapter 2. The limitations of the data and the overall design of the study prohibit exact statistical tests of differences. However, differences of more than plus or minus 20%, in the opinion of the authors, would have clearly been "statistically significant" if enough data on measurement errors and the provider population had been known and such testing been appropriate.

Table 5-1

TOTAL AVERAGE STANDARDIZED COST PER CHILDWEEK:
BY PROVIDER SERVICE TYPE
AND PROVIDER CLIENT HANDICAPPING CONDITION TYPE*

Provider Service Type	Provider Client Handicapping Condition Type						AVERAGE TOTAL DOLLARS		
	Primarily Emotionally Disturbed			Other Than Emotionally Disturbed					
	Average	N**	n***	Average	N**	n***	Average	N**	n***
Day Providers	$116.15	7	165	70.02	35	1464	79.46	42	1629
Mixed Providers	185.65	4	220	122.14	14	2927	139.70	18	3147
Residential Providers	215.57	8	655	196.15	27	2468	202.30	35	3123
AVERAGE TOTAL DOLLARS	168.64	19	1040	128.08	76	6859	$135.28	95	7899

* NOTE: Service Hours differ among Provider Types and Client Types.

** Number of Provider Institutions in Cell.

*** Total Number of Severely Handicapped Clients Served by Providers.

Table 5-2

AVERAGE STANDARDIZED COST PER CHILDWEEK
BY AGGREGATE SERVICE AREA AND STAFF CATEGORY
FOR 95 PROVIDERS

Aggregate Service Area	Staff Category												TOTAL DOLLARS
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Educational/ Habilitative	$1.21	0.06	2.68	3.18	2.18	9.06	0.67	6.43	29.66	7.29	0.45	3.65	66.52
Basic Care	0.98	0.43	0.90	0.04	0.05	1.88	3.55	13.71	4.67	2.54	15.25	1.66	45.66
Administration	17.98	0.02	0.43	0.20	0.34	1.06	0.36	0.32	1.35	0.30	0	0.74	23.10
TOTAL DOLLARS	20.17	0.51	4.01	3.42	2.57	12.00	4.58	20.46	35.68	10.13	15.70	6.05	$135.28

Note: 7899 severely handicapped clients served by these 95 providers.

amount spent on teacher aides ($10.13) is included. Interestingly, $20.17 of the $135.28 spent per week across all providers was applied to administrative activity.

5.2.1.2 Cost Within Provider Service Types

Tables 5-3 through 5-5 present the dollar data for the three provider service types, day, mixed, and residential. A detailed discussion about the 98 central and 48 marginal cells contained in these tables is unnecessary. However, there are a few comparisons which clearly deserve attention.

Within day providers (Table 5-3) the expenditures on certified teachers providing educational/habilitative service ($27.30) and administrators providing administrative services ($14.36) account for over one-half of all expenditures ($70.46). Within mixed providers (Table 5-4) and residential providers (Table 5-5) these cells remain a sizeable percentage of all expenditures. Nevertheless, their overall proportion of the total dollars expended decreases since in both mixed and residential providers basic care services provided by attendants and support staff remains high and becomes a significant percent (approximately 40%) of all expenditures.

Another interesting trend in the three tables is the ratio of certified teacher expenditures on basic care services to overall expenditures for certified teachers. In day providers 18.2% of the time of certified teachers is spent providing basic care to clients. In contrast, only 7.1% is spent in mixed providers, and 9.6% is spent by residential providers. Examination of these data and expenditure data contained in Appendices C, D, and E, would appear to suggest that the proportion of certified teacher time spent in providing educational/habilitative care is greatest in mixed and residential providers and lowest in day providers.

5.2.1.3 Costs Across Provider/Client Handicapping Condition Types

The contrast between the tables (Table 5-6, portraying the cost data for providers primarily serving emotionally disturbed clients, and Table 5-7, containing the cost data for providers primarily serving other than emotionally disturbed clients) is marked. Providers serving emotionally disturbed clients averaged $168.64 per week per average standardized cost per childweek whereas all other providers average $128.08 per childweek. A great deal of this difference appears to be centered in the combined cost of psychiatrists and therapists ($50.60) in emotionally disturbed providers, and these staff categories in providers serving other clients ($7.36). This cost difference, plus the doubled cost of administering

Table 5-3

AVERAGE STANDARDIZED COST PER CHILDWEEK
BY AGGREGATE SERVICE AREA AND STAFF CATEGORY
FOR DAY PROVIDERS

Aggregate Service Area	Staff Category												TOTAL DOLLARS
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Educational/ Habilitative	$1.54	0	0.14	1.18	2.09	6.94	0.14	0.14	27.30	8.20	0	0.81	48.48
Basic Care	0.21	0.06	0	0.01	0.02	0.48	0.31	0.23	6.41	2.79	2.38	0.01	12.91
Administration	14.36	0.04	0.02	0.10	0.37	0.97	0.01	0	1.56	0.60	0	0.04	18.07
TOTAL DOLLARS	16.11	0.10	0.16	1.29	2.48	8.39	0.46	0.37	35.27	11.59	2.38	0.86	$ 79.46

Note: 1629 severely handicapped clients served by these 42 providers.

Table 5-4

AVERAGE STANDARDIZED COST PER CHILDWEEK
BY AGGREGATE SERVICE AREA AND STAFF CATEGORY
FOR MIXED PROVIDERS

Aggregate Service Area	Staff Category												TOTAL DOLLARS
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Educational/ Habilitative	$1.02	0.02	0.13	0.78	2.23	5.09	0.41	9.71	21.20	5.92	0	6.99	53.50
Basic Care	0.14	0.19	0	0.04	0	4.17	1.63	18.45	1.51	0.84	25.07	3.22	55.26
Administration	26.01	0.01	0	0.31	0.32	1.45	0.38	0.41	1.88	0.04	0	0.13	30.94
TOTAL DOLLARS	27.17	0.22	0.13	1.13	2.55	10.71	2.42	28.57	24.59	6.80	25.07	10.34	$139.70

Note: 3147 severely handicapped clients served by these 18 providers.

Table 5-5

AVERAGE STANDARDIZED COST PER CHILDWEEK
BY AGGREGATE SERVICE AREA AND STAFF CATEGORY
FOR RESIDENTIAL PROVIDERS

Aggregate Service Area	Staff Category												TOTAL DOLLARS
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Educational/ Habilitative	$ 0.91	0.14	7.04	6.83	2.23	13.60	1.43	12.54	36.65	6.83	1.19	5.52	94.93
Basic Care	5.06	0.99	2.44	0.09	0.10	2.51	8.47	27.94	4.08	3.07	24.76	2.92	82.43
Administration	17.98	0.01	1.15	0.27	0.32	0.98	0.77	0.67	0.84	0.06	0	1.89	24.94
TOTAL DOLLARS	23.95	1.14	10.63	7.19	2.67	17.09	10.67	41.15	41.57	9.96	25.95	10.33	$ 202.30

Note: 3123 severely handicapped clients served by these 35 providers.

Table 5-6

AVERAGE STANDARDIZED COST PER CHILDHOUR
BY AGGREGATE SERVICE AREA AND STAFF CATEGORY
FOR PROVIDERS PRIMARILY SERVING
EMOTIONALLY DISTURBED CLIENTS

Aggregate Service Area	Staff Category												TOTAL DOLLARS
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Educational/ Habilitative	$3.11	0	12.53	1.53	4.87	20.32	0.41	4.79	17.30	9.71	0.63	7.40	$82.60
Basic Care	0.27	0.04	4.21	0.03	0.15	6.92	1.24	5.82	1.07	3.24	17.47	3.14	43.60
Administration	31.24	0	2.12	0.09	1.05	4.50	0.41	0.32	2.05	0.39	0	0.27	42.44
TOTAL DOLLARS	34.62	0.04	18.86	1.65	6.07	31.74	2.06	10.93	20.42	13.34	18.10	10.81	$169.64

Note: 1040 severely handicapped clients served by these 19 providers.

Table 5-7

AVERAGE STANDARDIZED COST PER CHILDWEEK
BY AGGREGATE SERVICE AREA AND STAFF CATEGORY
FOR PROVIDERS PRIMARILY SERVING OTHER THAN
EMOTIONALLY DISTURBED CLIENTS

Aggregate Service Area	Staff Category												TOTAL DOLLARS
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Educational/ Habilitative	$0.74	0.07	0.22	3.60	1.51	6.24	0.73	6.83	32.74	6.68	0.40	2.71	62.47
Basic Care	2.41	0.52	0.07	0.04	0.03	0.62	4.13	15.68	5.58	2.37	14.67	1.29	47.41
Administration	14.59	0.03	0.01	0.23	0.16	0.20	0.34	0.32	1.18	0.28	0	0.86	18.20
TOTAL DOLLARS	17.74	0.62	0.30	3.87	1.70	7.06	5.20	22.83	39.50	9.33	15.07	4.86	$128.08

Note: 6859 severely handicapped clients served by these 76 providers.

emotionally disturbed clients ($31.24 versus $14.59) provides the primary source of the difference. Other differences in expenditures between these provider types are minimal in dollar terms.

5.3 Comparisons Across Aggregate Service Areas by Provider Types

Tables 5-8 and 5-9 present the dollar and percent comparisons across provider service and client types. As was the case with the more detailed tables, a full discussion of cross-cell comparisons is not as illuminating as calling attention to the most important differences.

The absolute dollars spent and the average standardized cost per child-week vary considerably across the provider types. For example, residential providers, on an average, spent $94.93 on educational/habilitative services. In contrast, day providers only spent $48.48. However, these cost data do not take into account educational/habilitative services provided by families to clients of day providers.

Programs for the emotionally disturbed require approximately twice the administrative costs of other provider types, excluding mixed service providers. Based on qualitative data, it would appear that providing services for emotionally disturbed clients, and/or organizing and administering institutions providing a variety of programs, increases the absolute dollar amounts necessary for administration per average standardized cost per childweek. Of course, the sample of providers and data in hand is insufficient to ascertain whether instituting such complex programs into providers of other types and sizes would also lead to increased administrative costs.

In contrast to these absolute dollar amounts, Table 5-9 presents the percents within provider type spent on the aggregate service areas. This table presents a slightly different perspective than the previous absolute dollar amount tables. For example, the total percent of expenditures for administration remains highest for providers of emotionally disturbed clients (25.2%) but is approximated by the percent spent by day (22.7%) and mixed (22.1%) provider service types. More importantly, the amounts spent by providers on educational/habilitative services appear to be more constant percents of provider expenditures. Interestingly, as has been the case in these cost discussions and previous sections, mixed providers

Table 5-8

AVERAGE STANDARDIZED COSTS PER CHILDWEEK:
DOLLAR ALLOCATION FOR AGGREGATE SERVICE AREAS
BY PROVIDER TYPES

Aggregate Service Area	Provider Service Types			Provider Client Types		All 95 Providers
	Day	Mixed	Residential	Emotionally Disturbed	Other Than Emotionally Disturbed	
Educational/ Habilitative	$48.48	$53.50	$94.93	$82.60	$62.47	$66.52
Basic Care	$12.91	$55.26	$82.43	$43.60	$47.41	$45.66
Administration	$18.07	$30.94	$24.94	$42.44	$18.20	$23.10
TOTAL DOLLARS	$79.46	$139.70	$202.30	$168.64	$128.08	$135.28

Table 5-9

AVERAGE STANDARDIZED COSTS PER CHILDWEEK

PERCENT ALLOCATION FOR AGGREGATE SERVICE AREAS

BY PROVIDER TYPES

Aggregate Service Area	Provider Service Types			Provider Client Types		All 95 Providers
	Day	Mixed	Residential	Emotionally Disturbed	Other Than Emotionally Disturbed	
Educational/ Habilitative	61.0%	38.3%	46.9%	49.0%	48.8%	49.2%
Basic Care	16.3	39.6	40.8	25.8	37.0	33.7
Administration	22.7	22.1	12.3	25.2	14.2	17.1
TOTAL PERCENT	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

appear to deliver relatively fewer educational/habilitative services per childweek (38.3%) than other provider types (46.9% and 61%). However, it must be remembered that the mixed providers were significantly larger and more complex than the other provider types.

5.4 Comparison Across Staff Categories and Aggregate Service

The preceding tables have examined the patterns within certain types of providers. The purpose of this section is to observe patterns across the various provider types. As was briefly outlined in Section 5.1.3, such comparisons are problematic because of various imputed cost burdens not captured in the cost data gathered for this study. However, a comparison of the marginals of the preceding tables does allow one to gain some insight as to the overall differences in staff and service allocation patterns across the various provider types. The purpose of the comparisons presented in the following two sections is to gain some insight into the overall resource allocation patterns. These comparisons cannot be used to address such questions as whether one type of provider is more "efficient" than another because it uses less of its resources.

5.4.1 Staff Category Comparisons

Tables 5-10 and 5-11 array the data from the horizontal margin of the preceding tables. The dollar amounts, Table 5-10, indicate that residential providers spend more on certified teachers and teacher aides, in absolute dollar terms, than any other provider service. Similarly, providers to the emotionally disturbed spend more on administration ($34.62) than any other provider service or client type. However, these absolute dollar amounts are somewhat misleading due to the large variation in the total dollars per childweek expended by the various client and service types. When the absolute dollar amounts are converted to percents in Table 5-11, more similarity can be seen than is obvious in dollar amounts presented in Table 5-10. For example, although residential providers spend the largest dollar amount per childweek on certified teachers, the percent of the total dollars this represents is less than half of the percent expenditure of day providers. Aside from the contrasts cited above, the similarities in expenditures for many categories in the table are worth noting. The percentages of staff costs associated with medical doctors, psychologists, and

Table 5-10

AVERAGE STANDARDIZED COSTS PER CHILDWEEK:
DOLLAR ALLOCATION FOR STAFF CATEGORIES
BY PROVIDER TYPES

Staff Categories	Provider Services Types			Provider Client Types		All 95 Providers
	Day	Mixed	Residential	Emotionally Disturbed	Other Than Emotionally Disturbed	
Administrators	$16.11	$27.17	$23.95	$34.62	$17.74	$20.17
Medical Doctors	$ .10	$ .22	$ 1.14	$ .04	$ .62	$ .31
Psychiatrists	$ .16	$ .13	$10.63	$18.86	$ .30	$ 4.01
Psychologists	$ 1.29	$ 1.13	$ 7.19	$ 1.62	$ 3.87	$ 3.42
Social Workers	$ 2.48	$ 2.55	$ 2.67	$ 5.07	$ 1.70	$ 2.57
Therapists	$ 8.39	$10.71	$17.09	$31.74	$ 7.06	$12.00
Nurses	$ .46	$ 2.42	$10.67	$ 2.06	$ 5.20	$ 4.58
Attendants	$ .37	$28.57	$41.15	$10.53	$22.83	$20.46
Certified Teachers	$35.27	$24.59	$41.57	$20.43	$39.50	$35.68
Teacher Aides	$11.59	$ 6.80	$ 9.96	$13.34	$ 9.33	$10.13
Support Staff	$ 2.38	$25.07	$25.95	$18.10	$15.07	$15.70
Other Staff	$ .86	$10.34	$10.33	$10.81	$ 4.86	$ 6.05
TOTAL	$79.46	$139.70	$202.30	$168.64	$128.08	$135.28

Table 5-41

AVERAGE STANDARDIZED COSTS PER CHILDWEEK: PERCENT ALLOCATION FOR STAFF CATEGORIES BY PROVIDER TYPES

Staff Categories	Provider Services Types			Provider Client Types		All 95 Providers
	Day	Mixed	Residential	Emotionally Disturbed	Other Than Emotionally Disturbed	
Administrators	20.3%	19.4%	11.8%	20.5%	13.9	15.5%
Medical Doctors	0.1	0.2	0.6	0.02	0.4	0.4
Psychiatrists	0.2	0.1	5.3	11.2	0.2	3.9
Psychologists	1.6	0.8	3.6	1.0	3.0	2.5
Social Workers	3.1	1.8	1.3	3.6	1.4	1.9
Therapists	10.6	7.7	8.4	18.8	5.6	8.8
Nurses	0.6	1.7	5.3	1.2	4.0	3.4
Attendants	0.5	20.5	20.3	6.5	17.8	15.0
Certified Teachers	44.4	17.6	20.5	12.1	30.8	26.3
Teacher Aides	14.6	4.9	4.9	7.9	7.3	7.5
Support Staff	3.0	17.9	12.8	10.7	11.8	11.5
Other Staff	1.1	7.4	5.1	6.4	3.8	4.4
TOTAL PERCENT	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

social workers, are relatively stable across all provider types. In passing, it should again be emphasized that the comparisons between provider service and client types must be made with the recognition that certain imputed burdens (e.g., basic care burdens borne by the families of people served by day providers) are not represented in the data.

5.4.2 Staff Category Comparisons as Indicators of Differential Staff Roles

Another way to look at the data in the Tables 5-2 through 5-11 are as indicators of the differing roles for the major staff categories within the various provider types as opposed to differences between provider types. Viewed from this perspective, the data in these tables points to some important differences in the roles of certified teachers, teacher aides, and therapists across the various provider types.

Certified Teachers

Certified teachers spend nearly one fifth of their time in day settings attending to the basic care needs of their clients. In contrast, certified teachers within residential settings only spend approximately one tenth of their time in such basic care activities. Similarly, certified teachers within providers serving primarily emotionally disturbed clients spend nearly 85% of their time providing educational/habilitative care and only approximately 15% of their time providing basic care and administrative services to their clients. Hence, from the perspective of the certified teacher, the role would appear to be more oriented toward providing educational/habilitative services within residential providers for primarily emotionally disturbed clients.

Teacher Aides

Teacher aides spend approximately one quarter to one half of their time providing basic care services to clients. In contrast to the variation observed in the certified teacher role, teacher aides tend to be much more uniformly involved in basic care activities across all provider types. As would be intuitively expected, teacher aides in residential settings seem to be utilized by certified teachers for basic care activities. Hence, the role of teacher aides within residential settings tends to be more heavily basic care-oriented than is the role of teachers in any other setting.

Therapists

As was the case with teachers, there is considerable variation in the role of therapists across provider types. For example, approximately 7% of therapists' time is spent in basic care within day care settings. In contrast, nearly 40% of therapists' time in mixed providers is spent in the provision of basic care services to clients. Within providers serving other than primarily emotionally disturbed clients the expenditures are even more startling with less than 3% of therapists' time involved in the provision of basic care and approximately 9% involved in administration. Given the variations in the types of therapy delivered across these provider types and the considerable variation in therapists' specialties within these provider types, such findings are not unexpected. However, the magnitude of these role differences is somewhat larger than expected.

5.5 Expenditure Patterns at the Provider Level

This chapter's opening sections have used the average standardized cost per childweek as the expenditure metric. As was described in Section 5.1, this metric represented the total cost for an average child for a week within a given provider. This metric allows maximum comparisons across the various provider service and client types. In this section we will briefly examine a metric, the total average standardized cost, that permits us to examine contrasts at the provider level. By removing the per childweek part of the calculation (where the number of severely handicapped clients was introduced, described in Section 5.1.2), we have a metric which can be interpreted as the total spent by the provider for a given staff category or service area in a week. Hence, by removing the consideration of the number of clients served, we have a metric which can allow us to see if there are differences among the 95 providers in terms of staff and service area expenditures. In essence, the analysis briefly described in this section is at the organizational level, in contrast to the previous sections which were at the individual client level.

Tables 5-12, 5-13, and 5-14 present comparisons similar to those made for per childweek data. Since the number of providers is limited (95), analysis of tables at a greater level of detail, for example, within provider

types, is subject to extreme values. One large provider serving primarily emotionally disturbed clients can seriously affect the values in cells where aggregate service areas are cross-tabulated with staff categories. For this reason, only the three aggregate tables will be discussed. For the convenience of the reader, more detailed tables have been included in Appendix F.

5.5.1 Overall Costs for Provider Service and Client Types

Table 5-12 presents the total average standardized cost per week for the various provider service and handicapping types. The data in the table clearly reflect the relatively small size of the day providers from a cost perspective as opposed to the relatively large mixed providers. This might reflect the necessity for some size before an institution can offer a variety of services for different handicapping conditions. Similarly, the table points out the relatively smaller size of the per week expenditures of residential providers serving primarily emotionally disturbed clients.

The data in this table, when compared to the childweek data contained in Table 5-1, shows an interesting contrast in the individual and provider level expenditures. The comparison of these two tables clearly reflects the fact that some of the cells contain providers with larger client populations than other cells.

5.5.2 Staff Category and Aggregate Service Area Comparisons

The staff category and aggregate service area data shown in Tables 5-13 and 5-14 are similar to the data presented in Tables 5-9 and 5-11 concerning the percentage allocations for per childweek costs. In particular, the percentage allocation for staff categories is within a few percentage points. However, both this table and the percent allocation for aggregate service area data (Table 5-13) show that, at the provider level, a larger percent of overall costs is associated with the basic care area. Of the 95 providers, 45.5% average standardized costs per week were spent on basic care. In contrast, the per childweek data for the 95 providers indicated that only 33.7% of all resources were spent on basic care. This discrepancy results from the association between the size of the provider costs for the aggregate service areas. As shall be seen in Chapter 6.0, the relationships between the total population of the provider, number of severely handicapped clients served by the provider, costs, and the quality indices, is complex.

Table 5-12

TOTAL AVERAGE STANDARDIZED COST PER WEEK
BY PROVIDER SERVICE TYPE
AND PROVIDER CLIENT HANDICAPPING CONDITION TYPE*

Provider Service Type	Provider Client Handicapping Condition Type						AVERAGE TOTAL DOLLARS		
	Primarily Emotionally Disturbed			Other Than Emotionally Disturbed					
	Average	N**	n***	Average	N**	n***	Average	N**	n***
Day Providers	$1169	7	165	3242	35	1464	3139	42	1629
Mixed Providers	10,547	4	220	18,231	14	2927	15,363	18	3147
Residential Providers	8040	8	655	12,504	27	2468	12,414	35	3123
AVERAGE TOTAL DOLLARS	6550	19	1040	9436	76	6859	$8854	95	7899

*NOTE: Service Hours differ among Provider Types and Client Types

** Number of Provider Institutions

*** Total Number of Severely Handicapped Clients Served by Providers

Table 5-13

AVERAGE STANDARDIZED COSTS PER WEEK

PERCENT ALLOCATION FOR AGGREGATE SERVICE AREAS

BY PROVIDER TYPES

Aggregate Service Area	Provider Service Types			Provider Client Types		All 95 Providers
	Day	Mixed	Residential	Emotionally Disturbed	Other Than Emotionally Disturbed	
Educational/ Habilitative	62.7%	30.9%	30.1%	48.7%	32.9%	35.2
Basic Care	21.5%	49.8%	50.1	30.0	48.3	45.5
Administration	15.8%	19.2%	19.8	22.3	18.8	19.3
TOTAL PERCENT	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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Table 5-14

AVERAGE STANDARDIZED COSTS PER WEEK
PERCENT ALLOCATION FOR STAFF CATEGORIES BY
PROVIDER TYPES

Staff Categories	Provider Services Types			Provider Client Types		All 98 Providers
	Day	Mixed	Residential	Emotionally Disturbed	Other than Emotionally Distrubed	
Administrators	12.8	16.8%	17.5%	19.3%	16.4%	16.8%
Medical Doctors	0.1	0.6	1.4	0.0	0.9	0.9
Psychiatrists	0.2	0.1	0.7	2.6	0.1	0.4
Psychologists	1.2	1.8	1.0	1.8	1.3	1.3
Social Workers	3.6	1.3	1.3	4.9	1.0	1.6
Therapists	8.2	7.2	6.8	13.9	5.9	7.1
Nurses	0.6	3.4	6.9	1.0	5.4	4.8
Attendants	1.0	28.5	24.4	6.9	24.2	21.6
Certified Teachers	56.3	11.7	7.7	15.4	16.9	16.6
Teacher Aides	11.6	3.3	3.9	8.2	4.4	4.9
Support Staff	3.6	18.7	23.3	16.7	19.6	19.2
Other Staff	0.7	6.6	5.1	9.5	3.9	4.8
TOTAL PERCENT	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The organization level data contained in these tables generally indicates that the provider types differ in more than the cost of services delivered to severely handicapped clients. These providers vary both in terms of their size, patterns of staff expenditures, and aggregate service area resource allocation patterns.

5.6 Source of Revenues Data

Information was gathered on the major sources of revenues for the providers. This information was calculated for the total provider level, and no attempt was made to divide source of revenues information into that associated with severely handicapped clients. The information that was gathered was divided into five categories, plus an "other" category.

- Funds received from state agencies,
- Federal funds received from federal agencies,
- Funds received from local agencies,
- Fees paid by families to the providers,
- Funds received from welfare agencies, and
- Funds received from other sources (i.e., foundation grants, third party payments, donations, endowments, and investments.)

These total dollar figures were then divided by the product of the number of weeks the provider operated annually times the total client population of the provider. Hence, the resultant number can be interpreted as the average total dollars per childweek.* The metric is not the same as the standardized costs described in previous sections. The differences between these metrics lie in the standardization of the expenditure data and the level of detail. However, the data does give a relatively accurate picture of the sources from which these providers draw their revenues.

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*The term per childweek employed here is not precisely accurate. The total population of a small percent of the providers contained clients that were younger than 5 or older than 17 years of age. However, this discrepancy does not seriously impair the interpretability of the source of revenues estimates.

5.6.1 Source of Revenue Patterns Across Provider Service Types

As was the case with other cost analyses, examination of the data indicated that the distinctions between provider service types in terms of sources of revenues were considerable. Table 5-15 shows the dollar and percent data for the six sources of revenues by the three provider service types. For example, although the percent of their budgets constituted by federal funds is relatively constant across the three provider types (14%, 14%, and 16%), the dependence on state funding varies from a low of $34 for day providers to a high of 64% for residential providers. Another interesting difference is in the area of dependence on local funding. Day and mixed providers received 35% and 12% respectively from local agencies. This is in sharp contrast to the small amount received by residential providers.

An equally important observation is the lack of significant dependence on family fees as a revenue source among all provider types. Although the $37 paid by families to residential providers is the largest dollar amount of any provider type, it represents only 8% of the overall per child-week revenues for residential providers.

5.6.2 Selected Other Source of Revenues Data

The source of revenues data was also examined for differences with respect to the size of the provider and public/private status. Appendix E contains selected results from this analysis.

Funding from state agencies, usually a department of mental health or education, contributed an average of 49% of the 100 providers' total revenues. Across all providers, 76% received at least some state funds. This did not vary very much among providers. The only important difference by size of the severely handicapped population served was the dramatically greater reliance on state funding among the very large providers.

5.6.2.1 Federal Funding

Revenues from various federal agencies (almost exclusively agencies within the Department of Health, Education and Welfare) contributed an average of 14% to the annual income of the providers. Very large providers received proportionately less in federal funding than other providers.

Table 5-15

Average Total Dollars

Per Childweek for Total Client Population From

Sources of Revenues by Provider Service Type:

Dollars and Percents, 97 Providers*

Provider Service Type		Source of Revenues						Total
		State Funding	Federal Funding	Local Funding	Welfare Funding	Family Funding	Other Funding	
Day Provider	Dollars	$32	$15	$28	$ 2	$ 1	$16	$94
	Percent	34%	16%	30%	2%	1%	17%	100%
Mixed Providers	Dollar	$129	$34	$29	$ 7	$11	$38	$248
	Percent	52%	14%	12%	3%	4%	15%	100%
Residential Providers	Dollar	$297	$62	$ 2	$22	$37	$42	$462
	Percent	64%	14%	0%	5%	8%	9%	100%

* Comparison of these total revenues to the personnel expenditures in such tables as 5-1 must be made cautiously due to the basic inequality and measurement differences.

Private providers relied more heavily than public providers on federal support.

5.6.2.2 Local Funding

Revenues from local agencies, usually city or county education agencies, contributed slightly less than federal funding (12% of the providers' total budgets). Day providers relied more heavily than public providers on local support. There were almost no other major differences among providers in terms of local funding, although providers serving between 51 and 200 clients received proportionately more local funds than other providers. Local funds were received by 37% of the providers. Of course, day providers were much more likely than other providers to receive local funds.

5.6.2.3 Funding by Families

Fees paid by clients' families accounted for 5% of the total revenues for the 100 providers. Mixed and residential providers relied more heavily than day providers on family payments. Very large providers were least dependent on family payments, and private providers relied slightly more heavily than public providers on family payments.

Parents pay a fee for the clients in 53% of the providers, but in only 43% are family payments part of the provider's revenues. This is attributable to the fact that in some providers, particularly state-operated ones, the fees paid by families do not go directly to the provider but are contributed to the general operating fund of the state. Parents are more likely to pay for services in residential (or mixed) providers than day providers. Parents are less likely to pay in very small providers, and very few of the providers serving deaf-blind clients have parent fees. Private providers are more likely than public providers to charge parent fees. Where parents do pay, the average fee is $1756 a year. Parent fees are almost seven times as high in residential providers as in day providers. Thus, residential providers are both more likely to charge parents a fee and more expensive than day providers. On the other hand, although very small providers are the least likely to charge parents, when a fee is charged, it is considerably higher than the fees paid to larger providers. The cost to parents in

providers serving severely mentally retarded or severely emotionally disturbed clients is greater than the cost of other providers. Providers serving emotionally disturbed clients are also the most likely to charge parent fees. Although private providers are slightly more likely to have fees, they cost parents slightly less than those public providers which have fees.

5.6.2.4 Welfare Agency Payment

Payments by state and federal welfare agencies for the care of a client by a provider accounted for an average of 4% of the revenues for the 100 providers. However, only 21% of the providers receive welfare payments. Providers received about the same proportion of the funding from welfare regardless of the size of their severely handicapped population. Private providers were much more dependent upon welfare payments for funding than were public providers, probably because most welfare or social security money prevents "double payment" by the state, and would therefore not be payable to state-operated providers. Indeed, only 9% of the public providers receive any funds from welfare.

5.6.2.5 Other Funding

All the "other" funding sources together accounted for an average of 14% of the revenues for the 100 providers. The interpretability of this overall average is limited. The limited number of providers within this study, from a statistical point of view, discourages detailing of the several sources of other funds available to various providers. For example, one provider received approximately 20% of its funds from an endowment source. In contrast, another provider received 14% of its funds from a third-party reimbursement arrangement. Hence, the variability of sources within the "other" category leads to the summary observation that a more detailed analysis than the aggregate dollar estimates would be subject to considerable error due to the peculiar nature of the sample of providers.

5.7 A Note on Non-Personnel Expenditures

Information was also collected concerning the non-personnel expenditures of providers during the site visits. Table 5-16 presents the actual non-personnel expenditures for severely handicapped clients per childweek for the three major provider types.

Table 5-16

Average Total Dollars Per Childweek for Non-Personnel Expenditures by Provider Service and Client Type*

Provider Service Type	Provider Client Handicapping Condition Type				AVERAGE TOTAL DOLLARS	
	Primarily Emotionally Disturbed		Other Than Emotionally Disturbed			
	Average	N**	Average	N**	Average	N**
Day Providers	$29.44	8	$23.45	35	$24.56	43
Mixed Providers	$166.06	4	$47.86	14	$74.13	18
Residential Providers	$44.41	9	$40.72	27	$41.64	36
AVERAGE TOTAL DOLLARS	$61.88	21	$34.08	76	$40.10	97

*NOTE: Service Hours differ among Provider Types and Client Types.

** Number of Provider Institutions

Due to the wide range of facilities and equipment in use, allocation of non-personnel services and resources in terms other than actual dollar expenditures was not feasible. For this reason, the non-personnel expenditures data are problematic in several regards. Dollar expenditures are sensitive to local variation in the price of supplies (food, for example). The process of amortization of facilities and capital equipment expenditures also varied tremendously across providers. Some providers recorded actual rent or mortgage payments as expenditures, others amortized facilities or equipment (but over varying periods of time) and some simply reported no expenditures for space or large capital equipment. These providers were typically public (where the facility was owned by the state or municipal government) or private non-profit (operating in donated facilities).

It should be noted that non-personnel expenditures in the aggregate represent less than 25% of the overall expenditures of the providers studied. Given the limitations of this study, the relatively minor proportion of provider expenditures that these data represent, and the counfounding of these dollar estimates with such variables as public/private status, the estimates presented in Table 5-16 should be considered to be suspect. Although it is possible to design a study that would examine these estimates in detail, the design of the present study does not permit more detailed discussion of these expenditures.

6.0 THE RELATIONSHIPS BETWEEN QUALITY AND EXPENDITURES

The purpose of this chapter is to explore the relationships between the quality of service, defined in terms of the quality indices, and the expenditures associated with the observed levels of quality. The central research question is, "What levels of expenditure and what other factors, if any, are associated with various levels of quality?" Having determined by observation and analysis the ways in which expenditures, quality, and other factors are related, and assuming that they would be related in the same ways if expenditures were manipulated, we are in a position, in Section 6.3, to address two important policy questions: "Would (1) changes in resource allocation or (2) adding resources to providers with low quality ratings increase the various levels of quality?"

6.1 The Variable Set

The identification of any variable of a variable set for a given analysis begins with the central question. The primary purpose of the analysis presented in this chapter is to examine the factors and levels of cost expenditure that are associated with various levels of quality. This research question clearly identifies the dependent variables as the quality indices described in Chapter 2.0 as independent variables. Unfortunately, little guidance can be found in this research question for selection of other variables beyond the expenditures that might be associated with quality. The problem of selection from among the several hundred variables available for analysis was considerable. Had sufficient prior research involving these variables been available, the task would have been greatly simplified. As was documented in Volume One of this report, in the severely handicapped area such empirical precedents did not exist. Hence, a two-fold selection procedure, largely based on the data collected and informed judgments of the project directors, was undertaken.

The first phase of this selection procedure was negative. Variables were eliminated from consideration that:

- had insufficient variability or reliability for statistical analysis,
- were not inherently policy-relevant, or

- were an integral part of the quality index and would therefore artifactually be associated with it.

The judgments concerning individual variables were made in conjunction with the staff of the Office of Planning, Budgeting and Evaluation. However, final responsibility for the judgments involved rests with the project directors.

The second phase of the variables selection procedure was more positive. Based on the detailed characteristics of the providers discussed in Chapter 3.0 of this volume, and detailed in Appendix E, variables that were empirically observed to be associated with the quality indices were considered for inclusion in the analysis. The results of this selection procedure were six initial variable sets:

(1) the eighteen quality indices,

(2) the four cost variables representing the total personnel costs per childweek for each of the three aggregate service areas and the provider,

(3) the total number of clients served by the provider,

(4) the total number of severely handicapped clients served by the provider,

(5) whether the providers served primarily emotionally disturbed clients or other types of clients, and

(6) the public/private status of the provider.

However, with only 95 data cases available for analysis, it was imperative to be judicious in terms of the selection of variables.*

These six variable sets were considered in the following manner. The 18 quality indices were the major dependent variables. The cost variables were the primary independent variables. The remaining four sets of variables were considered to be third variables (that is, they conditioned the relationship between the independent and dependent variables).

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* The problems encountered by such analytic approaches as multiple regression approaches where the ratio of the number of cases to the number of variables is less than 9 to 1 is well documented. For example, see Kendall and Stuart, The Advanced Theory of Statistics, Vol. 2, Hafner, New York, 1972, p. 377, for the estimation of confidence intervals under such circumstances.

6.1.1 General Methodological Considerations

The methodological problems involved in examining the basic relationships between the cost and quality variables were considerable. In particular, upon examination, the distributions of 10 of the 18 quality indices were observed to be dichotomous. Specifically, although 17 of the quality indices were conceptualised to have three categories, the observed values filled two per index in 10 cases. In such situations, the normal regression approaches must be amended, especially when there are few cases. D.R. Cox, in the Analysis of Binary Data (Methuen & Company: London, 1970), points out that general linear least-square approaches are extremely problematic in such situations.

In addition to the problems generated by the binary nature of the dependent variables, the analysis also faced a relatively small n situation. With only 95 usable cases, the power and sensitivity of many techniques becomes questionable. What made this situation even more problematic, was the results of the analysis presented in Chapter 5.0, and the qualitative impressions conveyed through the study staff's analysis of the overall data base, and the case studies. Specifically, day, residential, and mixed providers are clearly qualitatively different. Pooling them into a single analysis, in which patterns of relationships between variables are of interest, was inappropriate. Such a pooling would mask relationships. Hence, the actual maximum number of cases available for any analysis was 42 cases.

The final methodological problem confronting the analysis, centered on the multivariate nature of the research questions before the study, as well as the acknowledged multivariate nature of the relationships being studied. This was problematical in that analyzing multivariate relationships forces the analysis toward inclusion of several third and independent variables simultaneously. Unfortunately, the problems outlined above severely limit the number of degrees of freedom available for such analysis.

6.1.2 Analysis Strategies Chosen

Given the objectives of the analysis and the problems cited above, the decision was made to employ a variety of analysis strategies, dependent on the particular stage of the analysis. This decision has led to the creation of an analysis section which will begin with bivariate cross-tabs,

move through multiple regression techniques, and eventually employ advanced calculus for a particular modelling analysis. Each of these techniques has its own strengths and weaknesses, which will be pointed out as appropriate.

The bivariate cross-tabulations provide a simple and straightforward picture of the relationships between the quality indices and the average standardized costs per childweek. However, they shed little light on the nature of this basic relationship when the third variables, such as size of provider, are introduced. The second analytic technique chosen, multiple regression, for all its problems in this particular methodological situation, does provide some insights into the effects introduction of these third variables has on the basic relationships between cost and quality.

In the final policy analysis sections of this chapter, the bivariate cross-tabulations are employed for generating simple estimates of the costs of increasing quality. This eclectic selection of techniques to suit the demands of the particular analysis involved may seem unusual given the propensity of most studies to select a single "best" technique and employ it throughout an entire analysis. Fortunately, the results generated by these contrasting analytic techniques were very similar. Specifically, similar patterns of relationship were observed across all analyses. Although it cannot be mathematically or statistically demonstrated, this cross-validation of the basic results of the study by the various techniques would seem to lend credence to the overall results of the analysis.

6.2 The Basic Relationships

The purpose of this subsection is to examine the relationships between the independent, third, and dependent variable sets. The first section will examine the relationship between the 18 quality indices and the three aggregate service areas, as well as the overall provider expenditures, by use of cross-tabulations. The second section, 6.2.2, will examine the relationship between the cost variables and two aggregate quality scales, employing multiple regression procedures.

6.2.1 The Basic Bivariate Relationship Between Cost and Quality

The average standardized cost per childweek is related to quality, as measured by the eighteen quality indices. However, it is not a simple relationship that is uniform across all indices. The relationship depends on the quality variable being examined, and the provider service type. The exact relationships are outlined in Tables 6-1 through 6-4. The first of these tables represents the total average standardized cost per childweek. The remaining three tables show the average standardized cost per childweek for the educational/habilitative, basic care, and administrative aggregate service areas. With minor rounding error inaccuracies, the cell entries in Tables 6-2 through 6-4 sum to cell entries in Table 6-1. For convenience, the cells within each quality index and provider service type that contained the highest levels of expenditures have been shaded in each table.

As an examination of the tables reveals, the absolute cell frequencies are often less then four cases. Hence, for both the statistical problems encountered in such small n situations cited earlier in this volume, and the conceptual and methodological problems involved in calculating and interpreting at least 318 pairwise t tests, the summarization of these tables was accomplished in a more qualitative manner.

Table 6-5 is intended to be a summary of Tables 6-1 through 6-4. This table is intended to summarize only the direction and not the magnitude of the basic relationships between costs and the quality indices. All non-zero differences were considered to be real. The magnitude of the differences will be addressed within the special policy analysis discussed in Section 6.3.

The data summarized in Table 6-5 are largely consistent with the notion that cost and quality are positively related in most instances. In particular, three quality indices are clearly positively related to total provider expenditures by providers. The three indices are:*

- Percentage of staff time spent on educational/habilitative tasks,
- Personal possessions of clients, and
- Staff development opportunities,

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* Complete descriptions of the quality indices are contained in Section 2.4.9.

Table 6-1

TOTAL AVERAGE STANDARDIZED COST PER CHILDWEEK FOR QUALITY INDICES BY LEVEL OF QUALITY AND PROVIDER SERVICE TYPE*

Quality Indices	Level of Quality	Provider Service Type: Day	Mixed	Residential
1) Range of Educational/ Habilitative Materials	Low	-	-	-
	Medium	$119 (3)	$124 (2)	$133 (9)
	High	75 (39)	138 (16)	222 (26)
2) Percentage of Staff Time Spent on Educational/ Habilitative Tasks	Low	-	-	61 (1)
	Medium	42 (7)	102 (2)	191 (4)
	High	85 (35)	147 (15)	211 (29)
3) Amount of Client Time Spent on Educational/ Habilitative Tasks	Low	33 (1)	-	-
	Medium	48 (2)	42 (1)	205 (5)
	High	80 (39)	142 (17)	202 (26)
4) Warm Staff-Client Interactions	Low	77 (39)	134 (18)	201 (34)
	Medium	30 (1)	-	139 (1)
	High	-	-	-
5) Instructive Staff Behaviors	Low	75 (31)	131 (17)	206 (31)
	Medium	79 (9)	218 (1)	146 (4)
	High	150 (1)	-	-
6) Parent Involvement with the Provider	Low	100 (6)	154 (3)	293 (13)
	Medium	90 (24)	138 (14)	168 (20)
	High	51 (14)	52 (1)	157 (2)
7) Parent Involvement with Their Child	Low	122 (1)	-	-
	Medium	60 (18)	141 (4)	238 (12)
	High	90 (23)	128 (13)	179 (23)
8) Respect for Clients **	Low	90 (20)	126 (10)	165 (22)
	Medium	-	-	-
	High	66 (21)	137 (8)	257 (13)
9) Privacy	Low	57 (2)	153 (2)	155 (10)
	Medium	113 (7)	100 (7)	174 (13)
	High	74 (28)	161 (9)	264 (12)
10) Non-Institutionalized Environment	Low	$ 62 (2)	-	$125 (3)
	Medium	88 (18)	126 (13)	219 (22)
	High	70 (21)	164 (8)	179 (10)
11) Personal Possessions	Low	-	-	23 (1)
	Medium	-	135 (1)	88 (2)
	High	78 (41)	136 (17)	212 (32)
12) Physical Comfort	Low	65 (28)	150 (9)	249 (15)
	Medium	109 (12)	124 (8)	152 (15)
	High	44 (1)	111 (1)	192 (5)
13) Evidence of Client Assessment	Low	-	-	-
	Medium	60 (13)	197 (4)	173 (9)
	High	85 (29)	119 (14)	217 (24)
14) Evidence of Program Evaluation	Low	79 (16)	124 (5)	241 (21)
	Medium	51 (7)	142 (6)	151 (14)
	High	86 (19)	140 (7)	220 (10)
15) Staff Development Opportunities	Low	36 (3)	-	121 (3)
	Medium	67 (10)	104 (7)	153 (7)
	High	96 (29)	137 (11)	221 (25)
16) Evidence of Client Functional Level Improvement	Low	64 (21)	153 (8)	177 (15)
	Medium	118 (10)	113 (5)	136 (9)
	High	67 (11)	132 (5)	201 (11)
17) Evidence of Movement of Severely Handicapped Clients Out of Provider into Less Sheltered Settings	Low	62 (13)	186 (3)	163 (13)
	Medium	96 (8)	117 (7)	155 (12)
	High	80 (21)	135 (8)	298 (10)
18) Evidence that Clients Receive Educational/Habilitative Services After Discharge from the Provider	Low	66 (16)	240 (3)	190 (15)
	Medium	34 (4)	108 (3)	162 (2)
	High	94 (14)	135 (14)	211 (18)

* Cell entries are dollar means. Numbers in parentheses are frequencies. Shaded cells are highest costs within each quality index and provider type.

** This quality index had only two allowable ratings: Low and High.

Table 4-3

TOTAL AVERAGE STANDARDIZED COST PER CHILDWEEK FOR QUALITY INDICES BY LEVEL OF QUALITY AND PROVIDER SERVICE TYPE: EDUCATIONAL/HABILITATIVE AGGREGATE SERVICE AREA*

Quality Indices	Level of Quality	Provider Service Type			Quality Indices	Level of Quality	Provider Service Type		
		Day	Mixed	Residential			Day	Mixed	Residential
1) Range of Educational/ Habilitative Materials	Low	-	-	-	10) Non-Institutionalized Environment	Low	$ 58 (2)	-	$ 81 (3)
	Medium	$ 84 (3)	$ 68 (2)	$ 68 (9)		Medium	61 (18)	63 (13)	144 (22)
	High	35 (39)	78 (28)	108 (28)		High	54 (21)	106 (5)	126 (8)
2) Percentage of Staff Time Spent on Educational/ Habilitative Tasks	Low	-	-	139 (1)	11) Personal Possessions	Low	-	-	22 (1)
	Medium	31 (7)	44 (2)	119 (4)		Medium	-	66 (1)	87 (2)
	High	63 (32)	84 (15)	148 (28)		High	57 (41)	75 (17)	149 (21)
3) Amount of Client Time Spent on Educational/ Habilitative Tasks	Low	23 (1)	-	-	12) Physical Comfort	Low	48 (28)	89 (9)	139 (14)
	Medium	32 (2)	0 (1)	89 (5)		Medium	88 (12)	61 (8)	92 (15)
	High	59 (38)	79 (17)	154 (25)		High	34 (1)	50 (1)	130 (5)
4) Warm Staff-Client Interactions	Low	56 (39)	75 (18)	121 (33)	13) Evidence of Client Assessment	Low	-	-	-
	Medium	14 (1)	-	103 (1)		Medium	39 (13)	127 (4)	90 (9)
	High	157 (1)	-	-		High	66 (29)	60 (14)	104 (23)
5) Instructive Staff Behaviors	Low	55 (31)	71 (17)	131 (30)	14) Evidence of Program Evaluation	Low	37 (16)	58 (5)	139 (17)
	Medium	61 (9)	144 (1)	72 (4)		Medium	38 (7)	69 (6)	94 (14)
	High	106 (1)	-	-		High	64 (19)	78 (7)	145 (9)
6) Parent Involvement with the Provider	Low	73 (4)	61 (3)	203 (12)	15) Staff Development Opportunities	Low	21 (3)	-	119 (3)
	Medium	64 (24)	81 (14)	111 (20)		Medium	44 (10)	48 (7)	89 (7)
	High	41 (14)	22 (1)	87 (2)		High	66 (29)	92 (21)	160 (24)
7) Parent Involvement with Their Child	Low	108 (1)	-	-	16) Evidence of Client Functional Level Improvement	Low	43 (21)	98 (8)	113 (15)
	Medium	42 (18)	88 (4)	196 (12)		Medium	99 (10)	52 (5)	84 (9)
	High	67 (23)	64 (13)	112 (22)		High	47 (11)	61 (5)	237 (10)
8) Respect for Clients**	Low	68 (20)	71 (10)	99 (22)	17) Evidence of Movement of Severely Handicapped Clients Out of Provider into Less Sheltered Settings	Low	41 (13)	117 (3)	112 (13)
	Medium	-	-	-		Medium	81 (8)	74 (7)	95 (12)
	High	47 (21)	79 (8)	220 (12)		High	58 (21)	59 (8)	246 (9)
9) Privacy	Low	50 (2)	105 (2)	95 (10)	18) Evidence that Clients Receive Educational/Habilitative Services After Discharge from the Provider	Low	46 (16)	160 (1)	126 (15)
	Medium	99 (7)	52 (7)	113 (13)		Medium	25 (4)	57 (3)	162 (2)
	High	51 (28)	86 (9)	218 (11)		High	71 (22)	72 (14)	153 (17)

* Cell entries are dollar means. Numbers in parentheses are frequencies. Shaded cells are highest costs within each quality index and provider type.

** This quality index had only two allowable ratings: Low and High.

Table 6-1

TOTAL AVERAGE STANDARDIZED COST PER CHILDWEEK FOR QUALITY INDICES BY LEVEL OF QUALITY AND PROVIDER SERVICE TYPE: BASIC CARE AGGREGATE SERVICE AREA *

Quality Indices	Level of Quality	Provider Service Type		
		Day	Mixed	Residential
1) Range of Educational/ Habilitative Materials	Low	-	-	-
	Medium	4 (3)	28 (3)	42 (9)
	High	3 (39)	28 (16)	28 (25)
2) Percentage of Staff Time Spent on Educational/ Habilitative Tasks	Low	-	-	8 (1)
	Medium	3 (7)	34 (2)	32 (4)
	High	3 (35)	28 (15)	33 (29)
3) Amount of Client Time Spent on Educational/ Habilitative Tasks	Low	0 (1)	-	
	Medium	2 (2)	14 (1)	74 (5)
	High	3 (39)	29 (17)	26 (25)
4) Warm Staff-Client Interactions	Low	3 (39)	28 (18)	32 (33)
	Medium	0 (1)	-	9 (1)
	High	3 (1)	-	-
5) Instructive Staff Behaviors	Low	3 (31)	27 (17)	31 (30)
	Medium	4 (9)	50 (1)	18 (4)
	High	4 (1)	-	-
6) Parent Involvement with the Provider	Low	3 (4)	29 (3)	35 (12)
	Medium	3 (24)	29 (14)	28 (20)
	High	3 (14)	13 (1)	46 (2)
7) Parent Involvement with Their Child	Low	7 (1)	-	-
	Medium	3 (18)	30 (4)	23 (12)
	High	3 (23)	26 (13)	37 (22)
8) Respect for Clients **	Low	2 (20)	31 (10)	34 (22)
	Medium	-	-	-
	High	4 (21)	24 (9)	27 (12)
9) Privacy	Low	3 (2)	23 (2)	29 (10)
	Medium	3 (7)	25 (7)	28 (13)
	High	3 (28)	32 (9)	39 (11)
10) Non-Institutionalized Environment	Low	5 (2)	-	29 (3)
	Medium	3 (18)	27 (13)	30 (22)
	High	3 (21)	31 (5)	17 (9)
11) Personal Possessions	Low	-	-	1 (1)
	Medium	-	29 (2)	27 (2)
	High	3 (41)	28 (17)	33 (31)
12) Physical Comfort	Low	3 (28)	26 (9)	34 (14)
	Medium	2 (12)	29 (8)	30 (15)
	High	3 (1)	39 (1)	32 (5)
13) Evidence of Client Assessment	Low	-	-	-
	Medium	3 (13)	14 (4)	44 (9)
	High	3 (29)	26 (14)	29 (23)
14) Evidence of Program Evaluation	Low	3 (16)	26 (5)	24 (11)
	Medium	5 (7)	28 (6)	27 (14)
	High	2 (19)	28 (2)	49 (9)
15) Staff Development Opportunities	Low	4 (3)	-	20 (3)
	Medium	3 (10)	22 (7)	34 (7)
	High	3 (29)	32 (11)	33 (24)
16) Evidence of Client Functional Level Improvement	Low	2 (21)	29 (8)	30 (15)
	Medium	5 (10)	26 (5)	25 (9)
	High	3 (11)	28 (5)	41 (10)
17) Evidence of Movement of Severely Handicapped Clients Out of Provider into Less Sheltered Settings	Low	2 (13)	36 (3)	31 (13)
	Medium	2 (8)	24 (7)	30 (12)
	High	4 (21)	30 (8)	50 (9)
18) Evidence that Clients Receive Educational/Habilitative Services After Discharge from the Provider	Low	3 (16)	38 (2)	25 (15)
	Medium	4 (4)	28 (3)	20 (2)
	High	3 (22)	28 (14)	39 (17)

* Cell entries are dollar means. Numbers in parentheses are frequencies. Shaded cells are highest costs within each quality index and provider type.

** This quality index had only two allowable ratings: Low and High.

Table 6-4

TOTAL AVERAGE STANDARDIZED COST PER CHILDWEEK FOR QUALITY INDICES BY LEVEL OF QUALITY AND PROVIDER SERVICE TYPE: ADMINISTRATIVE AGGREGATE SERVICE AREA*

Quality Indices	Level of Quality	Provider Service Type			Quality Indices	Level of Quality	Provider Service Type		
		Day	Mixed	Resi-dential			Day	Mixed	Resi-dential
1) Range of Educational/ Habilitative Materials	Low	-	-	-	10) Non-Institutionalised Environment	Low	3 (2)	-	12 (3)
	Medium	18 (3)	20 (2)	17 (9)		Medium	28 (28)	28 (13)	27 (22)
	High	15 (39)	29 (16)	24 (24)		High	13 (21)	23 (5)	26 (8)
2) Percentage of Staff Time Spent on Educational/ Habilitative Tasks	Low	-	-	33 (1)	11) Personal Possessions	Low	-	-	2 (1)
	Medium	7 (7)	22 (2)	21 (4)		Medium	-	33 (1)	30 (3)
	High	17 (35)	29 (15)	26 (28)		High	13 (41)	28 (17)	26 (30)
3) Amount of Client Time Spent on Educational/ Habilitative Tasks	Low	4 (1)	-	-	12) Physical Comfort	Low	13 (28)	25 (3)	28 (33)
	Medium	15 (2)	28 (1)	14 (5)		Medium	21 (12)	28 (0)	26 (15)
	High	16 (39)	28 (17)	25 (24)		High	14 (1)	20 (1)	17 (5)
4) Warm Staff-Client Interactions	Low	15 (39)	28 (17)	26 (24)	13) Evidence of Client Assessment	Low	-	-	-
	Medium	15 (1)	-	10 (1)		Medium	17 (13)	23 (4)	33 (9)
	High	8 (1)	-	-		High	15 (29)	30 (14)	22 (22)
5) Instructive Staff Behaviors	Low	15 (31)	29 (17)	29 (29)	14) Evidence of Program Evaluation	Low	17 (16)	30 (8)	18 (11)
	Medium	13 (9)	20 (1)	24 (4)		Medium	7 (7)	21 (6)	26 (14)
	High	44 (1)	-	-		High	17 (19)	28 (7)	34 (8)
6) Parent Involvement with the Provider	Low	24 (4)	38 (3)	29 (11)	15) Staff Development Opportunities	Low	7 (3)	-	31 (3)
	Medium	18 (24)	23 (14)	24 (20)		Medium	19 (10)	29 (7)	23 (7)
	High	8 (14)	17 (1)	22 (2)		High	15 (29)	28 (11)	25 (23)
7) Parent Involvement with Their Child	Low	7 (1)	-	-	16) Evidence of Client Functional Level Improvement	Low	17 (21)	20 (8)	21 (14)
	Medium	14 (18)	18 (4)	20 (12)		Medium	12 (10)	32 (5)	26 (9)
	High	17 (23)	30 (13)	26 (21)		High	16 (11)	37 (8)	31 (10)
8) Respect for Clients**	Low	18 (20)	27 (10)	24 (21)	17) Evidence of Movement of Severely Handicapped Clients Out of Provider into Less Sheltered Settings	Low	17 (13)	30 (3)	17 (12)
	Medium	-	-	-		Medium	9 (8)	15 (7)	24 (12)
	High	13 (21)	30 (8)	23 (12)		High	17 (21)	40 (8)	38 (9)
9) Privacy	Low	6 (2)	12 (2)	21 (10)	18) Evidence that Clients Receive Educational/Habilitative Services After Discharge from the Provider	Low	16 (16)	20 (1)	24 (14)
	Medium	9 (7)	20 (7)	23 (13)		Medium	4 (4)	19 (3)	28 (2)
	High	18 (28)	38 (9)	33 (10)		High	17 (22)	31 (14)	25 (17)

* Cell entries are dollar means. Numbers in parentheses are frequencies. Shaded cells are highest costs within each quality index and provider type.

** This quality index had only two allowable ratings: Low and High.

Table 6-5

Summary of Direction of Relationship
between Average Standardized Cost per Childweek and Quality Indicators
by Provider Service Type and Aggregate Service Area

Quality Index	Provider Service Type	Aggregate Service Area			Total Dollar Expenditures (Table 6-
		Educational/ Habilitative (Table 6-2)	Basic Care (Table 6-3)	Administrative (Table 6-4)	
1) Range of Educational/ Habilitative Materials	Day				
	Mixed	+		+	+
	Residential	+			+
2) High Percentage of Staff Time Spent on Educational/Habilitative Tasks	Day	+		+	+
	Mixed	+		+	+
	Residential	+	+	-	+
3) Amount of Client Time Spent on Educational/ Habilitative Tasks	Day	+	+		+
	Mixed	+	+		
	Residential	+			
4) Warm Staff-Client Interactions	Day	+	+		
	Mixed	-			
	Residential	-	-	-	-
5) Instructive Staff Behaviors	Day	+		+	+
	Mixed			-	
	Residential	-		-	-
6) Parent Involvement with the Provider	Day	-		-	-
	Mixed			-	-
	Residential	-	+	-	-
7) Parent Involvement with their Child	Day	-	-	+	-
	Mixed			+	
	Residential		+	+	
8) Respect for Client	Day	-	+	-	-
	Mixed	+	-	+	+
	Residential	+	-	-	+
9) Privacy	Day			+	
	Mixed		+	+	+
	Residential	+	+	+	+

KEY: + = Highest expenditures, High quality
(Blank) = No clear relationship (e.g., highest expenditures, medium quality)
- = Highest expenditures, Low quality

Summary of Direction of Relationship
Table 6-5, contd.

Quality Index	Provider Service Type	Aggregate Service Area			Total Dollar Expenditures Table 6-1)
		Educational/ Habilitative (Table 6-2)	Basic Care (Table 6-3)	Administrative (Table 6-4)	
10) Non-Institutionalized Environment	Day		-		
	Mixed	+	+		+
	Residential	+			
11) Personal Possessions	Day	+	+		+
	Mixed	+			+
	Residential	+	+		+
12) Physical Comfort	Day		-		
	Mixed	-	+	-	-
	Residential	-	-	-	-
13) Evidence of Client Assessment	Day	+			+
	Mixed			+	
	Residential	+			+
14) Evidence of Program Evaluation	Day	+			+
	Mixed		+		
	Residential	-	+	+	-
15) Staff Development Opportunities	Day	+	-		+
	Mixed	+	+		+
	Residential	+		-	+
16) Evidence of Client Functional Level Improvement	Day			-	
	Mixed	-	-	+	-
	Residential	+	+	+	+
17) Evidence of Movement of Severely Handicapped Clients Out of Provider into Less Sheltered Settings	Day		+		
	Mixed		-	+	
	Residential		+	+	
18) Evidence that Clients Receive Educational/ Habilitative Services After Discharge from the Provider	Day	+		+	+
	Mixed		-	+	
	Residential		+		+

KEY: + = Highest expenditures, High quality
(Blank) = No clear relationship (e.g., highest expenditures, medium quality)
- = Highest expenditures, Low quality

The expenditure patterns across the aggregate service areas within these four quality indices are almost exclusively positive in nature. This indicates that high ratings on these four quality indices are most likely found in providers who were observed to be greater than average on expenditures. The exception to this generalization is in administrative, and to a lesser extent basic care, aggregate service area expenditures for the personal possessions and staff development opportunities index ratings. As the tables show, expenditure on basic care aggregate service areas frequently showed no clear relationship, and in two instances a negative relationship with high-quality ratings in these two indices.

In addition to these four variables, three other quality indices showed somewhat positive relationships to average standardized costs per childweek.

- Range of educational/habilitative materials,
- Privacy, and
- Evidence of client assessment.

Within these three quality indices, the relationship between total dollar expenditures was identifiable in residential and mixed providers.

One final quality index, the amount of client time spent on the educational/habilitative tasks, was observed to be positively related to costs. However, the positive relationship was evidenced relative to expenditures in the educational/habilitative aggregate service area. Given the nature of this index, this is not surprising. What this finding would tend to confirm, is that expenditures for teachers and other educational/habilitative service personnel do seem to be translated into increases in the amount of staff and client time spent on educational/habilitative tasks. However, this does not necessarily mean that the total dollar expenditures for providers are similarly high.

Of the eleven remaining quality indices, eight fall into what could be best considered as a "both positive and negative relationship to expenditures." The remaining indices seem to be negatively associated to costs. Because these are individually important indices, they will be discussed separately.

1.) Warm staff client interactions - the results on this index indicate that warm staff client interactions are negatively related to cost in

residential providers. In contrast, high ratings for this index were observed to be positively associated with educational/habilitative and basic care costs in day providers.

2.) Instructive staff behaviors - In a pattern similar to that of the warm staff-client interactions index, high quality ratings on this index were negatively related to expenditures in residential providers and positively related to expenditures in day providers. No clear pattern was evident from mixed providers.

3.) Parent Involvement with a Provider - Parent involvement with a provider was observed to be negatively associated with costs, with the lone exception of basic care expenditures within residential providers. There are several hypotheses for why such a relationship might be observed. For example, intensive programs staffed by professionals might result in relatively high costs, and low parent involvement. However, data does not exist within this study to ascertain with any degree of certainty, the causal relationships that determine this particular relationship.

4.) Parent Involvement with the Child - Although the relationship between cost and quality ratings for the parent involvement with their child are not as clear as those for parent involvement with the provider ratings, there are some similarities. Based on the data, it would appear that involving parents with their children seems to be associated with high administrative costs regardless of provider type. Given the administrative complexities of administering such programs, this seems to be plausible. However, the negative relationship between educational/habilitative, basic care, and total dollar expenditures within day providers and the ratings for this quality index must not be overlooked. As was the case with the preceding index, there are multiple hypotheses available for explaining this observed relationship. Parent substitution for professional care by some providers cannot be dismissed as a plausible hypothesis.

5.) Respect for Client - The relationship between cost and ratings for this quality index was complex. There were six positive and six negative relationships with no unclear cells observed. As shall be seen in a later

section (6.3), the pattern of expenditures across the aggregate service areas seems most determinant of scores of high ratings on this quality index. The overall dollar expenditure is somewhat less important in obtaining high quality ratings on this index.

6.) Non-institutionalized environment - In most cases, there was no clear relationship between ratings on this index and the costs. Those few observed relationships were primarily within mixed providers. Given the fact that mixed providers were significantly larger in terms of client populations than the other two providers, it would seem consistent to observe that high costs would be associated with creating non-institutionalized environments in these large scale organizations.

7.) Physical comfort - Somewhat surprisingly, physical comfort seems negatively related to costs. However, it should be noted that we are examining personnel costs and producing or increasing physical comfort should be associated with non-personnel costs. Unfortunately, the non-personnel data available to the study was insufficient for testing this particular hypothesis.

8.) Evidence of program evaluation - High ratings on this quality index seem to be moderately associated with costs. Nevertheless, the majority of the relationships were unclear.

9.) Evidence of client functional improvement - Quality ratings on this index were clearly positively related to costs in residential providers. On the other hand, the relationship between quality, the ratings and costs were either neutral in the case of day providers, or largely negative in the case of mixed providers. At least one interpretation for these findings would be the importance of functional improvement in residential settings.

10.) Evidence of movement of severely handicapped clients out of the provider into less sheltered settings - There was no clear relationship between total dollar expenditures or educational/habilitative aggregate service area costs and quality ratings for this index. However, administrative costs and basic care costs were largely positively related to this quality index. Given the necessity for administrative costs to accomplish the phenomenon which this index attempts to measure, these would seem to be credible findings.

In view of the exploratory nature of these quality indices and the measurement problems associated with measuring quality in these settings, the congruence between the expenditure measured and quality indices measured in a relatively precise metric is encouraging. Future researchers interested in more elaborate and precise measurements of some aspect of quality should find the preceding results suggestive of the nature of the basic relationships between various types of costs and dimensions of quality.

It should be added that future researchers should attempt to avoid the situation where the quality indice measurement techniques result in binary scales. From a measurement and analysis point of view, binary scales present special problems for analysis.(*) For example, even the Pearson Product moment correlation coefficient, upon which most standard regression analysis programs operate is inappropriate. Even more serious is the effect of measurement errors when the responses are not evenly split between the two response categories as was the case in this study. However, the effect of majority of the 18 quality indices being observed to be essentially binary in this study does not prohibit analysis in the preceding or forthcoming sections. What it does do is contribute yet another methodological factor which could artificially suppress relationships which do in fact exist and restrict analysis of the quality indices themselves to a linear condition since only a straight line can be drawn between two points.

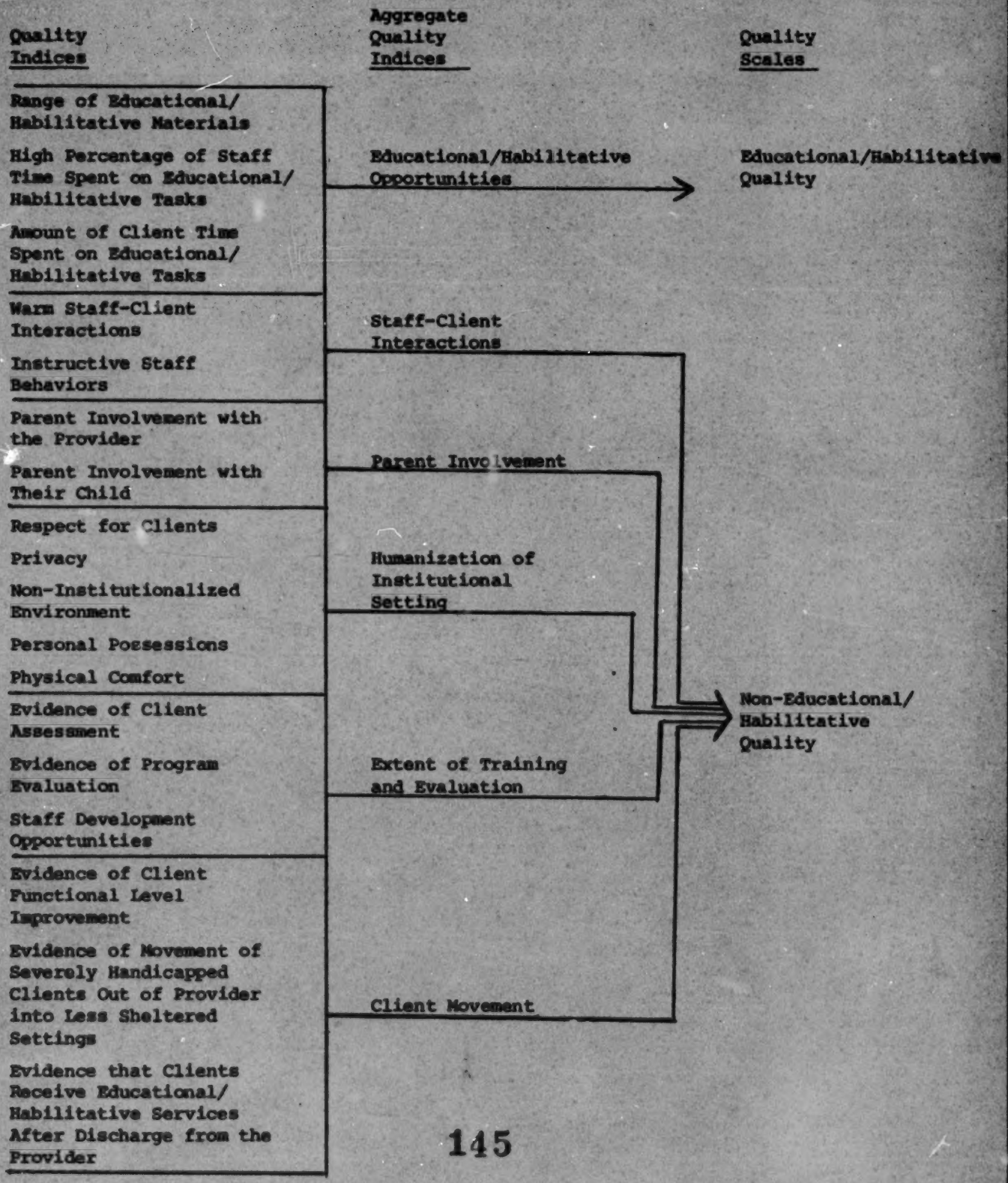
6.2.2 Multiple Regression Analysis

As was outlined in Section 6.1.1, the methodological problems involved in applying multiple regression analysis to the current data base are considerable. However, given the objective of gaining some insights as to the relationship between cost and quality when important mediating variables are considered, the intent is worthy.

(*) See D.R. Cox's Analysis of Binary Data (London; Methuen and Co.,1970) for a brief introduction to these problems and literature.

Table 6-6

General Schematic Representation of Quality Scale Construction


Quality Indices
Aggregate Quality Indices
Quality Scales
Range of Educational/ Habilitative Materials
High Percentage of Staff Time Spent on Educational/ Habilitative Tasks
Amount of Client Time Spent on Educational/ Habilitative Tasks
Educational/Habilitative Opportunities
Educational/Habilitative Quality
Warm Staff-Client Interactions
Instructive Staff Behaviors
Staff-Client Interactions
Parent Involvement with the Provider
Parent Involvement with Their Child
Parent Involvement
Respect for Clients
Privacy
Non-Institutionalized Environment
Personal Possessions
Physical Comfort
Humanization of Institutional Setting
Evidence of Client Assessment
Evidence of Program Evaluation
Staff Development Opportunities
Extent of Training and Evaluation
Non-Educational/ Habilitative Quality
Evidence of Client Functional Level Improvement
Evidence of Movement of Severely Handicapped Clients Out of Provider into Less Sheltered Settings
Evidence that Clients Receive Educational/ Habilitative Services After Discharge from the Provider
Client Movement

In order to undertake the regression analysis it was necessary to aggregate the variable set beyond the reductions noted in the preceding sections given the methodological problems encountered in multiple regression analysis when the ratio of cases to variables in the analysis is nine to one.

6.2.2.1 Aggregation of Variable Sets

The primary reduction in the number of variables, prior to the regression analysis, resulted from the aggregation of the 18 quality indices into two quality scales. The process involved in this aggregation is outlined in Table 6-6. The first step in this process, the aggregation of the 18 quality indices into six aggregate quality indices, was done on theoretical grounds outlined on page 32 through 35 of this volume. The further aggregation of these six aggregate quality indices into two quality scales was accomplished through an examination of the interrelationships between the aggregate quality indices. Table 6-7 contains the Pearson Product Moment Correlations between the aggregate quality indices. The correlations, excluding that between humanization and staff-client interaction are relatively low (less than .28). However, the educational/habilitative aggregate quality index was in no case correlated at greater than .16 with the other five indices. In addition, from a substantive and policy point of view, the aggregate educational/habilitative quality index is by itself an important index. An educational and rehabilitative emphasis is generally considered to be an important thrust of recent legislation. Hence, on empirical, practical, and methodological grounds, the six aggregate quality indices were reduced to two scales: the educational/habilitative quality scale and a scale representing the sum of the five other aggregate quality indices. The correlation between the two resultant scales was .28. Generally, this is congruent with the earlier observations made in this and previous volumes. Although educational/habilitative quality does tend to be associated with other quality indices, the relationship between it and the other quality indices is far from unity.

A second reduction of the variable set was done through inspection of previous results and preliminary regression analyses. The public/private variable was eliminated because it was not correlated, at greater than .08, with any other variable of interest. Certain exploratory regression runs confirmed that public/private status was not associated in any significant way with other variables in the set of interest. Hence, the reduced variable set contained (1) two variables associated with the size of provider, total clients and total severely handicapped clients (2) whether the provider specialized in the care of emotionally disturbed clients, and (3) the aggregate cost per childweek values for the three aggregate service areas.

6.2.2.2 Bivariate Relationships

The logical and statistical basis for multiple regression analysis lies in the bivariate relationships between the variables of interest. Hence, before the regression analysis was undertaken, two types of bivariate analyses were performed:

- Selected scattergrams of pairs of independent, dependent, and mediating variables were examined, and
- Correlations within provider type were examined.

The purpose of this analyses was two-fold. First, to ascertain if non-linear relationships existed between variables of interest, and/or if bivariate relationships differed significantly between various provider groups, and second, to explore the basic relationships between the variables themselves. The results of these two analyses, described below, were congruent. Specifically, both visually and statistically, there was no significant evidence of non-linear relationships. In addition, the magnitude and direction of the bivariate relationships between variables differed significantly across the three provider service types.

Scattergram Analysis

Examination of the bivariate relationships through scattergrams was undertaken prior to even the preliminary analyses. The raw untransformed cost data from the seven detailed service areas was plotted against the two quality indices. The purpose of this analysis, conducted before any of the cost analysis was undertaken, was to ascertain whether aggregation of the cost data to average standardized per childweek costs and aggregate quality and service areas was appropriate for the regression analysis. This examination, undertaken by the study staff in consultation with Office of Planning, Budget and Evaluation, concluded that no significant non-linear relationships existed that would be masked by this process.

Pearson Product Moment Correlation Analysis

The second bivariate analysis performed consisted of calculation of the zero-order Pearson Product Moment Correlations. The results of this analysis are presented in Table 6-8. The tests of statistical significance for the coefficients have not been included in this table nor will tests of significance be presented in the remaining sections of this chapter. The method of selection of the providers for inclusion in this study, as well as the considerable variation in the institutional settings in these providers, make tests of statistical significance very misleading. Hence, the relationships are presented in the correlational and regression analysis and are intended as statements of observed relationships with the providers studied. Generalization of the results to larger populations must be on the basis of either perceived similarities between the providers studied herein or the generality of the relationships themselves. However, had this been a data set amenable to tests of significance, correlations greater than .20 for the day and residential providers, and greater than .36 for the mixed providers would have been "statistically significant" at the $\alpha = .05$ level.

The most startling contrast in Table 6-8 lies in the preponderance of variables which are associated in different manners across the provider types. For example, the educational/habilitative and non-educational/habilitative quality scales are virtually unrelated in day providers (-.10), strongly related in a negative manner in mixed providers (-.54), and positively related in residential providers (.49). In at least 15 of the 28 cells in the table

Table 6-7

Pearson Product Moment Correlations

for Aggregate Quality Indices: 93 Providers

	Educational/ Habilitative Quality	Staff-Client Interaction	Parent Involvement	Humanization	Client Movement
Educational/ Habilitative Quality	—				
Staff-Client Interaction	.16	—			
Parent Involvement	.08	-.05	—		
Humanization	.06	.41	.14	—	
Training and Evaluation	.10	-.01	.25	.07	—
Client Movement	-.15	-.11	.28	.13	.04

Table 8-6

Pearson Product Moment Correlations
for Major Variable Groups by Provider Type*

Variable Group	Variable	Provider Type	Educational/ Habilitative	Non Educational/ Habilitative	Provider Client Type	Educational/ Habilitative	Basic Care	Administration	Number of Severely Handicapped Clients	Total Provider Handicapped Clients
Quality Scales	Educational/ Habilitative	Day	—							
		Mixed								
		Residential								
	Non Educational/ Habilitative	Day	-.81	—						
		Mixed	-.54							
		Residential	.49							
Provider Client Type**		Day	.00	.00	—					
		Mixed	-.10	-.05						
		Residential	.21	.22						
Average Standardized Cost Per Week	Educational/ Habilitative	Day	.24	.12	.08	—				
		Mixed	.47	-.40	.22					
		Residential	.13	.11	-.03					
	Basic Care	Day	.01	.08	-.36	-.03	—			
		Mixed	.15	-.10	.35	.73				
		Residential	-.04	.25	-.06	.04				
	Administration	Day	.10	-.03	.60	.04	-.30	—		
		Mixed	.16	.07	.53	.12	.23			
		Residential	.09	.26	.09	.02	.49			
Size of Provider	Number of Severely Handicapped Clients	Day	-.13	.40	-.13	.07	.22	-.32	—	
		Mixed	-.59	.41	-.29	-.33	-.03	-.22		
		Residential	-.10	.18	-.09	-.25	-.01	-.33		
	Total Provider Handicapped Clients	Day	.05	.15	-.27	.07	.38	-.25	.64	—
		Mixed	-.22	.29	0.36	-.31	-.18	-.28	.83	
		Residential	.08	.19	-.21	-.15	.10	-.13	.61	

Quality Scales			Average Standardized Cost Per Childweek			Size of Provider	
Educational/ Habilitative	Non Educational/ Habilitative	Provider Client Type	Educational/ Habilitative	Basic Care	Administration	Number of Severely Handicapped Clients	Total Provider Handicapped Clients

* Exact number of cases per cell will vary slightly but correlations are based on 43 day providers, 19 mixed providers, and 37 residential providers.

** This was a dummy variable with 0 equal to providers with primarily other than emotionally disturbed clients and 1 equal to providers with primarily emotionally disturbed clients

there are considerably different relationships between the various variables of interest across the provider types. Hence, the first major conclusion reached on the basis of the bivariate analysis was that the variable set of interest showed markedly different relationships across the various provider types. Aggregation of the day, mixed, and residential providers into a single group for the regression analysis would have seriously masked relationships.

Beyond this major initial finding, there are several relationships and patterns of interest within Table 6-8. Rather than enumerate each and every relationship, it would seem more appropriate to call attention to those few of considerable import. First, the zero-order relationships between educational/habilitative quality are noticeably strong in the case of the average standardized cost per childweek within educational/habilitative service area.

Interestingly, the relationship between the educational/habilitative index and the number of severely handicapped clients was uniformly negative across the three provider types. However, the relationship between non-educational/habilitative quality index and the indicators of size was positively related . It would appear that non-educational/habilitative care is better in larger providers but the educational/habilitative quality is somewhat less.

A third major finding was the negative relationship between the two indicators of size of provider and the costs of administration. Uniformly, both the number of severely handicapped clients and the total provider handicapped clients indicator were negatively related to the cost of administration. At least in the area of administration, economies of scale are realized. Expenditures on administration were not uniformly correlated across provider types with basic care and educational/habilitative expenditures. For example, within day providers a negative relationship between expenditures on administration and basic care existed (-.30), while within residential providers these expenditures were positively correlated (.65).

6.2.2.3 The Three Main Regression Models

At the completion of the bivariate analysis it was clear that given the ratio of cases to variables of interest, and the differences across day, mixed, and residential providers, the study was confronted with a difficult

choice. On the one hand, the number of cases available for day providers (41) and residential providers (34) was barely sufficient for a regression containing six independent and mediating variables in one dependent variable per iteration. However, the availability of only 19 mixed provider cases for analysis precluded a regression approach which would contain six variables. Hence, the study was confronted with a choice between:

- Omitting the mixed providers from the regression analysis, or
- Assigning the mixed providers to the day/residential provider types based on some particular provider characteristics.

The first choice meant excluding a major provider type serving severely handicapped clients from the analysis. The second alternative meant ignoring the results of the bivariate analysis which shows that the relationships among the variables of interest made the mixed providers unlike either the day or residential providers. Upon examination of these alternatives, a decision was made to omit the mixed providers from the regression analysis, rather than commit some error of assignment or inappropriate use of statistical techniques. This conservative course is defensible given the unusual characteristics of the mixed provider included in this study. Many of these providers were extremely large multi-service facilities and others were small public and private institutions serving specialized needs. The results of the regression analysis are limited to the day and residential provider types. Future studies should be designed to include a larger sample of mixed providers so that the omission necessitated within this study might be overcome.

After this basic decision was made, three regressions were undertaken for each of the two quality scales. First, a regression which contained the three mediating variables.*

- Emotionally disturbed/non-emotionally disturbed status,
- Total client population of provider, and
- Total severely handicapped population of the provider.

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*The independent variable set is being divided into three "mediating" and three "independent" variables for analytic convenience. The generic purpose of this Chapter is to investigate the relationship between cost and quality as conditioned. As we shall see, size and primary client type are important in determining quality, but are being separated from the cost variable in order to minimize confusion concerning the purpose of the analysis. The minimal overlap in use of a per week metric for costs and client population is acceptable.

In addition to these three mediating variables, three independent cost variables were included.

- The average standardized cost per childweek on aggregate educational/habilitative care services,
- The average standardized cost per childweek spent on aggregate basic care, and
- The average standardized cost per childweek spent by the provider on administration.

The first regression model was supplemented by a regression which contained only the independent cost variables on each of the quality scales, and a regression in which only the mediating variables were regressed on each of the quality indices. The results of these regressions are presented in Tables 6-7 through 6-11, Table 6-9 being the basic means and standard deviations.

6.2.2.4 Results of the Regression Analysis

Variance Explained

The first dimension of the results of the regression analysis worthy of note is the magnitude and difference in the overall variance explained (R^2) by the three regression models in Tables 6-10 and 6-11. Not surprisingly, the regression involving all six variables accounted for the most variance, from .14 to .23. In contrast, the regression of the independent cost variables on the quality indices yielded various explained coefficients only of from .03 to .09. Similarly, the regression runs involving the mediating variables explained from .09 to .18 of the variance. An examination of these results, and a number of stepwise regressions performed by the staff, clearly indicates that the mediating variables explain more of the variance in quality than the independent cost variables. However, the cost variables do add from .10 to .14 of the variance explained as a group.

The regression coefficients for the three main regression models are presented in Table 6-10 and the standardized regression coefficients are presented in Table 6-11. As can be seen from the tables, the dummy variable representing the emotionally disturbed/non-emotionally disturbed dichotomy, was overwhelmingly related to the dependent variable in all three models. This is not surprising, since the variable was introduced because of the previously observed differences between these two provider types in terms of cost. The regression coefficients for the remainder of the variables

Table 6-9

Means and Standard Deviations
of Regression Variables by
Provider Service Type

Variable Group	Variable	Provider Service Type			
		Day		Residential	
		Mean	Stan.Dev.	Mean	Stan.Dev.
Quality Scales (in index Points)	Educational/ Habilitative Quality	73.50	9.1	63.71	20.2
	Non-Educational/ Habilitative Quality	47.61	11.5	40.13	14.5
Average Standardized Cost Per Week (in Dollars)	Educational/ Habilitative	$58.65	73.5	$137.22	224.5
	Basic Care	$ 3.15	3.3	$33.69	34.8
	Administration	$13.81	14.7	$26.24	20.1
Size of Provider (in Clients)	Number of Severely Handicapped Clients	39.90	43.9	84.77	118.1
	Total Provider Handicapped Clients	71.26	64.8	222.89	278.5

Table 6-10

Regression Coefficients for Three Main Regression

Models by Provider Type:

Educational/Habilitative and Non-Educational/Habilitative Quality Scales

Dependent Variable	Provider Type	Mediating Variables			Independent Variables			R^2	N
		Emotionally Dis/ Non-Emotionally Disturbed*	Total Client Population of Provider	Total Severely Hand. Pop. of Provider	Average Standardized Cost Per Childweek				
					Educational/ Habilitative	Basic Care	Administration		
Educational/ Habilitative Quality	Day	4.91	.04	-.06	.03	.13	.05	.17	39
	Residential	13.75	.02	-.02	.02	-.09	.19	.14	31
Non-Educational/ Habilitative Quality	Day	-1.79	.04	.14	.01	.15	.07	.19	39
	Residential	8.52	.01	.01	.20	.03	.01	.23	31
Educational/ Habilitative Quality	Day	-	-	-	.03	.13	.05	.10	41
	Residential	-	-	-	.01	-.08	.17	.03	34
Educational/ Habilitative Quality	Day	-	-	-	.02	.27	-.02	.03	41
	Residential	-	-	-	.01	.05	.13	.09	34
Educational/ Habilitative Quality	Day	6.20	.04	-.06	-	-	-	.10	39
	Residential	13.40	.02	-.03	-	-	-	.09	31
Non-Educational/ Habilitative Quality	Day	-.30	-.03	.13	-	-	-	.18	39
	Residential	9.03	.01	-.01	-	-	-	.09	31

Table 6-11

Standardized Regression Coefficients for Three Main Regression Models by Provider Type: Educational/Habilitative and Non-Educational/Habilitative Quality Scales

Dependent Variable	Provider Type	Mediating Variables			Independent Variables			R^2	N
		Emotionally Dis/ Non-Emotionally Disturbed *	Total Client Population of Provider	Total Severely Hand. Pop. of Provider	Average Standardized Cost Per Childweek				
					Educational/ Habilitative	Basic Care	Administration		
Educational/ Habilitative Quality	Day	.19	.26	-.28	.22	.05	.07	.17	39
	Residential	.27	.26	-.13	.17	-.16	.19	.14	31
Non Educational/ Habilitative Quality	Day	-.06	-.21	.53	.09	.04	.09	.19	39
	Residential	.23	.23	.07	.21	.06	.27	.23	31
Educational/ Habilitative Quality	Day	-	-	-	.24	.05	.10	.07	41
	Residential	-	-	-	.11	-.14	.17	.03	34
Educational/ Habilitative Quality	Day	-	-	-	.13	.08	-.03	.03	41
	Residential	-	-	-	.11	.12	.18	.09	34
Educational/ Habilitative Quality	Day	.25	.31	-.30	-	-	-	.10	39
	Residential	.27	.23	-.18	-	-	-	.09	31
Non Educational/ Habilitative Quality	Day	-.01	-.18	.51	-	-	-	.18	39
	Residential	.25	.23	-.02	-	-	-	.09	31

*This was a dummy variable with 0 equal to providers with primarily other than emotionally disturbed clients and 1 equal to providers with primarily emotionally disturbed clients.

vary considerably. Expenditures on basic care, for day providers, and administration for residential providers, are most positively associated with educational/habilitative quality. In contrast, the total size of the severely handicapped population of a provider is slightly negatively correlated with educational/habilitative quality along with basic care expenditures within residential providers.

Inferring the "strength" (magnitude) of the relationships between the variables from the regression coefficients presented in these tables is misleading, as can be seen by examining the standard deviations of the variables presented in Table 6-9 and the differences in the magnitude of the regression and standardized regression coefficients.

6.3 Analysis Focused on Two Special Policy Questions

Two of the most important policy questions confronted in the conduct of research are:

- Are there ways that quality can be increased without adding dollar resources, and
- How much would it cost to increase quality x%?

In the remainder of this chapter we will address these two policy questions within the current study context using two different analytic techniques. An important caveat that must be stressed before the results of this particular analysis is presented. Specifically, the data upon which this study draws are:

- Non-experimental in nature, and
- Cross-sectional.

No experimental manipulation of providers was attempted nor was a longitudinal series of observations taken. Hence, inferences concerning the effects of adding more monies must be based on the assumption that providers' quality ratings would be changed by an increase in money input. As reasonable as this assumption may or may not seem, it is important to emphasize that it is an assumption of this particular analysis.

The analysis contained in this section both builds upon and extends the prior analyses. This analysis commences with the assumption that patterns of expenditures across the three aggregate service areas, as well as the total expenditures per provider, are the chief vehicles for increasing quality. Hence, this analysis is oriented toward dollar expenditures and not toward manipulating population size or other third variables.

6.3.1 Increasing Quality No Additional Costs

The purpose of the analysis contained in this section is to question whether quality could be increased without an increase in the total provider budget. Conceptually, we are interested in ascertaining whether certain patterns of expenditures by providers might be changed to increase the quality of a given type. Methodologically, this represents a considerable challenge. If we were to ask this question in the aggregate, across all eighteen quality indices, optimization methods would tend to force expenditures in the direction of the least expensive quality variables. Specifically, a cross-indices analysis would produce results that reallocated expenditures toward those quality indices that were the least expensive from a policy standpoint, given the importance of all of the indices. Hence, this section will examine each of the quality indices separately. This approach is methodologically advantageous since the degrees of freedom available for any particular analysis would be severely limited if all the quality indices were entered simultaneously.

Techniques of the type employed in this section are not new.* For example, analysis similar to that contained in this section was undertaken several years ago for the state of Hawaii for cost allocation among programs for the mentally retarded (F.H. Trinkl. A Stochastic analysis of Programs for the Mentally Retarded. Operations Research. Volume 22, No. 6, November/December 1974, pp. 1175-1191). However, the analysis and modeling required involves use of calculus, numerous tables, and technical discussions. Hence, since this report is primarily audienced toward non-technical audiences, the analysis outlined above has been placed in Appendix G. The following paragraphs contain a brief summary of the method and major findings of the actual analysis, and several important limitations and caveats, that must be placed on inferences concerning this particular analysis.

*For example, see Y. Bishop, S. Feinberg, P. Holland, Discrete Multivariate Analysis (MIT Press, Cambridge, Mass. 1975).

The method used was patterned after what is known as response surface analysis in econometrics. It consists of construction of a predictive model, in this case the three aggregate service area expenditures as independent and each of the quality indices as dependent variables, with subsequent use thereof for determining if certain optimal points exist within a defined space when the model is applied to the data. In this particular case, linear, quadratic, and interactive models were explored using the day provider data since the degrees of freedom required for the analysis were not available in the mixed and residential provider data.

The analysis showed that only four of the quality indices had a sufficient (*) relationship to the quality index and realistic optimal points. These four were:

1. Range of Educational/habilitative Materials
5. Instructive Staff Behavior
6. Parent Involvement with the Provider
8. Respect for Clients

Table 12 shows the results for these indicators of quality.

It also was found that among programs with low administrative expenditures, the respect for Client index peaks at a moderate level of educational/habilitative expenditures. At higher levels of administrative expenditures the level of respect for clients appears generally lower, and there is no longer a clear relationship between respect for clients and either educational/habilitative expenditures or basic care expenditures.

In general detailed results indicated that moderate shifts in expenditures between the aggregate service area expenditures were optimal. The exact amounts and patterns differed across the four quality indices presented below.

(*) A relatively liberal criterion of sufficiency was employed. Specifically, an adjusted $\bar{R}^2$ of greater than .20.

Table 6-12

MODEL RESULTS FOR DAY PROVIDERS

Three Aggregate Service Area Expenditures: Quadratic Model Three

	Quality Index	R^2	Adjusted R^2	F[(b)]	P
1.	Range of Educational Materials	.49	.33	2.93	.025
2.	% Staff Time on Educational	.26	.02	1.08	
3.	Amount of Client Time on Educational Task	.08	0	0.25	
4.	Warm Staff-Client Interactions	.27	.02	1.08	
5.	Instructive Staff Behavior	.51	.35	3.13	.010
6.	Parent Involvement in Provider	.40	.21	2.03	
7.	Parent Involvement with Child	.35	.14	1.64	
8.	Respect for Clients	.54	.39	3.51	.005
9.	Privacy	.12	0	0.41	
10.	Non-Institutional Environment	.29	.05	1.22	
11.	Personal Possessions [(a)]	----	----	----	
12.	Physical Comfort	.12	0	0.42	
13.	Evidence of Client Assessment	.16	0	0.55	
14.	Evidence of Program Evaluation	.21	0	0.79	
15.	Staff Development Opportunities	.14	0	0.50	
16.	Evidence of Client Functional Level Improvement	.24	0	0.96	
17.	Movement to less Sheltered Structure	.38	.18	1.86	.10
18.	Evidence that Clients Receive E-H Services	.33	.11	1.50	

(a) All day providers received the same quality rating for personal possessions.

(b) Degrees of freedom: regression = 9, residual = 27; 37 cases are used in the analysis.

It is appropriate to conclude our brief discussion of this analysis with three notes of caution. As the last example clearly illustrates, because we are dealing with non-experimental data, causal inference is risky and may be clearly wrong. We can be fairly confident of the correspondence between certain budget configurations and levels of the quality indicators. We must have less confidence, however, in the results of moving an existing program from one budget level to another, since both quality and cost may reflect unmeasured underlying factors which may or may not shift to maintain the quality-cost relationship under which the programs naturally evolved.

Second, the R^2 values reported serve to reinforce the fact that there are indeed other contributions to quality than cost. Even in the best of predictions we were able to explain only about half of the quality variance from cost data. The remaining variance reflects the impact of forces which will continue to operate even if budgets are changed, and which will continue to have a significant impact on provider quality.

Finally, it should be remembered that these analyses are based on 37 day providers for whom data were available. This sample by no means covers the range of possible budget levels and combinations of priorities. This means that the optimizations are sometimes forced to extrapolate to cost levels relatively remote from the greatest mass of the data. Inherent in such extrapolation is the propagation of any error introduced by either measurement error or incomplete model specification to potentially large levels. In a sense these data are protected from the worst consequences of such error, since in general the the quality surface near optimal levels seems rather insensitive to small changes in the individual cost components. This means that missing the optimal point will not have particularly dire consequences. The other side of this coin, however, is that since the consequences of departure from optimality are small the designated optima found by the model must

be interpreted as indicative of general regions within which programmatic judgment can still be exercised, not as prescriptive points at which budgets must be fixed.

6.3.2 The Effects of Adding More Monies

The purpose of the analysis outlined in this section is to address the question of how much money would be required to raise quality some increment. As the analysis outlined thus far in this chapter conveys, the answer to this question is complex. In some instances the question itself is inappropriate. For example, we observed that increases in monies seem to be associated with lower quality ratings. Simultaneously, we have noted throughout this volume the qualitative and quantitative differences between providers, based on their service type and the type of clientele they serve.

In addition to the observed complexity of the relationship, the limited number of cases available for analysis presented considerable methodological problems. In addition, the measurement techniques employed in the study resulted in limited variability on the quality indices, in most cases a binary distribution.* Hence, the regression estimates displayed in Section 6.2.1 are not appropriate for estimation of unit increases in quality vis-a-vis cost due to the distribution of the dependent variable and the other methodological problems cited. However, this study was charged with the responsibility of attempting to estimate the costs of increasing quality. The analysis presented in the remainder of this section is, in the opinion of the study staff the best that could be undertaken given the study design and data.

6.3.2.1 The General Relationship

The preceding paragraphs have outlined the difficulties of estimating the relationship between quality and increases in total average standardized cost per childweek. What can be done? First, it must be realized that the posing of the question of increases in quality for increases in expenditures must be limited to those variables which were observed to have positive

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* Given the exploratory nature of this study, it cannot be concluded that the variability inherent in the quality indices is in any way limited.

relationships between cost and quality. Examination of the variables which were observed to have neutral or negative relationships between cost and expenditures would, for example, imply that reductions in expenditures would result in increases in quality. To reach this conclusion would, in spite of the observed relationships, be totally inaccurate for a variety of reasons. However, the question of the effects of adding more resources has been limited to those variables where there is a positive relationship between cost and quality. This choice was made in view of the nature of the analytic question being addressed in this section.

With these important caveats, the general relationship documented in Sections 6.2 and 6.3.1 is presented in Table 6-13. As the table indicates, the major findings in regard to the relationship between cost and quality center on the consistency of the relationship between cost and quality within provider service types, for the variables of interest. Clearly, although the absolute dollar amounts spent by day, mixed, and residential providers differ across provider service types, the general relationship between cost and quality appears constant for the variables of interest. Hence, the costs of increasing quality from low to medium, or from medium to high levels, appear relatively equal across provider types. Evidence for this important assertion comes from three sources. First, the regression analysis presented in section 6.3.1. As this analysis showed, the slope of the regression of total average standardized costs per childweek on the two quality indices was approximately the same across the provider service types. Secondly, the similarities in patterns observed in the basic scatterplots examined in the initial stages of the analysis. And lastly, in the actual quality step costs observed in the analysis presented in the next section. Hence, for those variables for which a positive relationship was observed, equal expenditures within provider type should increase quality by approximately the same increment, across the provider service types.

It should be emphasized that to pool provider types for purposes of this analysis does not contradict nor lessen the importance of the differences between provider service types discussed throughout this volume. The analysis presented is limited to positively related variables and, as has been pointed out, it does not suggest that additional resources would necessarily bring the same changes in providers of different service types.

6.3.2.2 Dollar Estimates

How many dollars would be required to increment quality from low or medium to high quality? Given the observed complexity of the relationship, the inappropriateness of the regression coefficients as estimators, and the lack of cases in many of the key cells, Table 6-1 remains the most straightforward estimator of the cost of increasing quality. Table 6-14 contains the different scores for the four positively related variables. As the table shows, the costs of increasing quality would appear to vary considerably across the quality indices and provider types. However, since the dependent variable creating these estimates is redundant across providers, it cannot be concluded that the costs of increasing each quality index are independent. Specifically, the Table shows that the costs of increasing the observed differences in the total average standardized cost per childweek for day providers on high percentage of staff time spent on educational/habilitative tasks, and amount of client time spent on educational/habilitative tasks differed by $43 and $32 per childweek on the average. It cannot be concluded that the cost of increasing both of these quality indices from medium to high would be seventy-five dollars. In order to conclude that the cost of raising both quality indicators would be $75, one would have to assume the changes in each quality index was independent of other quality indices. As was shown earlier in this chapter, quality indices are at least moderately correlated. Hence, what Table 6-14 suggests is that those exhibiting high in each quality index was independent of other quality indices. As was shown earlier in this chapter, quality indices are at least moderately correlated. Hence, what Table 6-14 suggests is that those exhibiting high quality appear to be $19 to $124 more per average standardized childweek than those providers exhibiting medium quality. By arraying the original estimates on a simple continuum for both the steps one can see that, after some corrections are made for extreme and near zero values, that it costs slightly more to go from low to medium quality (55 to $130) than from medium to high quality ($50 to $120).*

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* These corrections amounted to the elimination of two outlying cases. These cases had average standardized costs per childweek of substantially more and less then all other providers. However, these eliminations had very little effect on the estimates. The only noticeable effect was raising the lower estimate for costs of moving from medium to high quality from $19 to $50.

Table 6-13

GENERAL ILLUSTRATION OF RELATIONSHIP BETWEEN AVERAGE STANDARDIZED COST PER CHILDWEEK AND POSITIVELY RELATED QUALITY INDEX X BY PROVIDER SERVICE TYPE

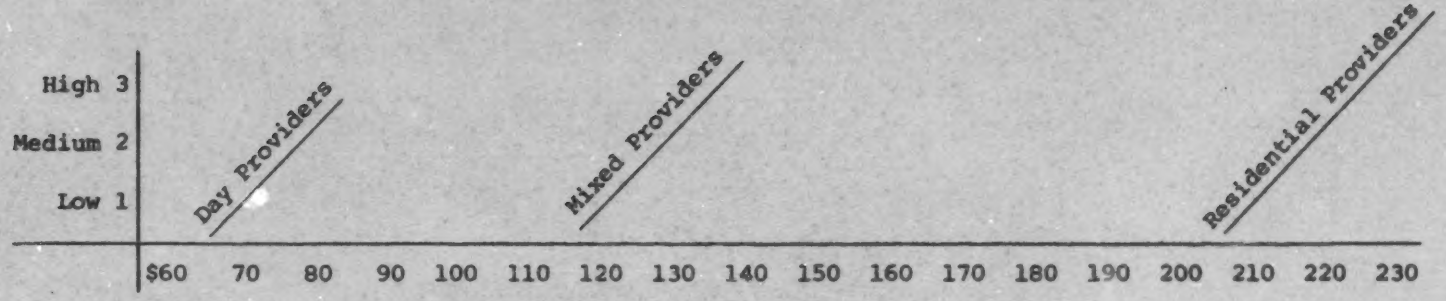
QUALITY RATING
High 3
Medium 2
Low 1
Day Providers
Mixed Providers
Residential Providers
$60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230
Total Average Standardized Cost Per Childweek

Table 6-13

GENERAL ILLUSTRATION OF RELATIONSHIP BETWEEN AVERAGE STANDARDIZED COST PER CHILDWEEK AND POSITIVELY RELATED QUALITY INDEX X BY PROVIDER SERVICE TYPE

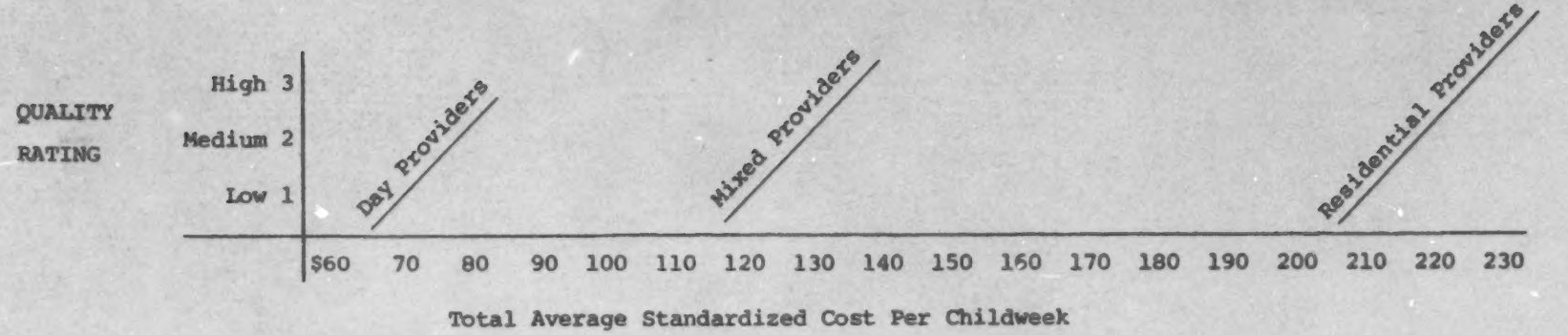
QUALITY RATING
High 3
Medium 2
Low 1
Day Providers
Mixed Providers
Residential Providers
$60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230
Total Average Standardized Cost Per Childweek

Table 6-14

ESTIMATED INCREASE IN AVERAGE STANDARDIZED COST PER CHILDWEEK FOR STEP INCREASES IN QUALITY BY PROVIDER SERVICE TYPE AND SELECTED QUALTIY INDICES: TOTAL DOLLARS PER WEEK*

QUALITY INDICES	Change in Level of Quality**	Provider Service Type		
		Day	Mixed	Residential
2) Percentage of Staff Time Spent on Educational/ Habilitative Tasks	Low to Medium	--	--	$130
	Medium to High	$43	$45	$20
3) Amount of Client Time Spent on Educational/ Habilitative Tasks	Low to Medium	$15	--	--
	Medium to High	$32	$100	$-3
11) Personal Possessions	Low to Medium	--	--	$65
	Medium to High	--	$1	$124
15) Staff Development Opportunities	Low to Medium	$31	--	$32
	Medium to High	$19	$53	$68

* Column and Row totals and/or averages are not meaningful since they are both redundant and non-additive. For example, the same provider might appear in up to eight cells.

** The exact calculations involved the subtraction of the cell means for the total average standardized cost per childweek presented in Table 6-1. For example, the cost of the medium to high step ($43) for day providers was calculated by subtracting the average for medium quality day providers ($42) from the average for high quality day providers ($85).

What is being suggested here is not that the administrators of providers would necessarily use monies to increase the four quality indices if such additional resources were made available. Nor is it being suggested that such resources would be used by various provider service types in the same way. What is being suggested by these estimates is that on the average the additional resources within this range would increase quality in providers. Data on what specific allocation decisions would be made by providers is not available from this study.

7.0 SUMMARY OF MAJOR FINDINGS

This chapter will briefly summarize the substantive findings of the preceding chapters. It should be emphasized that the findings presented here have been limited to those concerning the patterns of relationships between variables. The 100 providers studied were purposefully selected from a self-selected set of providers who returned the initial questionnaire. Hence, it is erroneous to conclude that the distributions of variables such as provider size are similar to those which might have been found had a random sample of providers been available for study. However, the relationships among such variables as cost and quality can be defended as a study finding. There is little evidence to suggest that patterns of relationships at the institutional level differ in institutions which volunteer and do not volunteer for institutional studies. The evidence at hand would suggest, in the judgment of the project staff, that the sample of providers included in the study were typical of providers across the nation. The basic distributions of provider characteristics can be found in Appendix A of this volume.

The organization of this chapter parallels the organization of this volume.

- Section 7.1 contains the findings regarding important selected characteristics of the providers. In particular, the differences among the three types of providers, size of provider, handicapping conditions, and differences noted in the observational situations, will be discussed.
- Section 7.2 presents the findings concerning average standardized costs per childweek, and
- Section 7.3 outlines the major findings relative to the relationship between cost and quality.

The purpose of this chapter is to highlight major findings, not to be encyclopedic and cover all findings.

7.1 Summary of Major Findings Relative to Selected Characteristics of Providers

The characteristics that most delineated the data at all levels were:

- Type of provider,
- Size of provider, and

- Handicapping condition of clients served.

Since these characteristics were clearly important in all areas of the analysis, they will be discussed separately in each of the following sections. The major findings of the observational study will be discussed, followed by the cost of care analysis. Finally, the results of the cost of care analysis are presented.

7.1.1 Type of Provider

Over the course of the project it became increasingly evident that day, mixed and residential providers were characteristically different from each other on virtually every dimension (see Chapter 6). Not only were the services provided to severely handicapped clients in day, mixed, and residential providers quantitatively different but the corresponding costs and quality of services were also markedly dissimilar in the providers studied. Given the differences which emerged between different types of providers, it is clear that the three types of providers cannot, for both analytic and policy purposes, be equated.

Provider type discriminated for the majority of the several hundred variables collected and analyzed. The following limited set of variables should convey some of the most important differences and leave the reader with an impression of the overall importance of the variable.

- Educational/Habilitation Services. All day providers offered educational and habilitative services to severely handicapped clients while 90% of residential providers offered these services.

- Medical Services. Residential providers offered medical services to their clients more often than day providers.

- Admissions. Residential providers had an average waiting period for admission of 7.7 months, more than twice the waiting period for day providers.

- Acceptance. The rate of client acceptance in day providers was notably higher (83% of applicants were accepted) than in residential providers (61% of applicants were accepted).

- Length of Stay. Not surprisingly, clients remain enrolled in day providers for a shorter period of time than clients enrolled in mixed and residential providers.

- Post-Discharge Education. Severely handicapped clients released from day providers were most likely to be receiving educational services in public schools after release, while those discharged from residential providers were most likely to continue to receive educational services in non-school settings.

- Rate of Release. Day providers released fewer clients per year than residential or mixed providers, the primary reason for discharge in both types of providers being improvement in client functioning level.

- Post-Release Residential Placement. Clients were most likely to be released to their natural home as opposed to another type of living setting.

- Parent Involvement. More parents were actively involved in the planning and delivery of services to their child in day as opposed to residential providers.

- Source of Funds. Residential and mixed providers depended slightly more on state funds than did day providers, but state funds were the most important source for all types of providers.

- Parent Fees. Parents were more likely to pay for services in residential or mixed providers than in day providers. As expected, residential or mixed providers were observed to be more expensive when they do charge than are day providers.

7.1.2 Provider Size

One very important manner of differentiating providers was in terms of the number of severely handicapped clients aged 21 and under that were served. This continuum was divided into four categories: providers serving fewer than 10 such clients, providers serving 10-50 clients, providers serving 51-200 clients, and providers serving more than 200 such clients. A second important dimension of size was the total number of clients served by the provider. The vast majority of the providers visited also served severely handicapped clients.

The number of severely handicapped clients aged 21 and under served was generally positively related to quality. An exception to this trend was the group of providers serving more than 200 severely handicapped clients, where the level of quality was lower than that for the 51-200 client cell. It is clear that the smallest providers (fewer

than 10 clients) had the lowest level of quality. The highest quality was observed in those providers serving between 51 and 200 severely handicapped clients.

The total number of clients served by the provider was also somewhat positively related to quality except in the largest providers. An inspection of the data indicated that large providers with many severely handicapped clients showed particularly low quality ratings.

The overall relationship between the two measures of provider size and quality could be decomposed into several pages of detail. However, the following important highlights should illustrate the general nature of the relationships.

- Range of Resources. Both size variables were highly related to the type and range of resources available within the provider with larger providers offering more services. Since the range of services relates directly to quality, it was observed that size was strongly related to quality.

- Small Providers. Smaller providers (especially those serving fewer than 10 severely handicapped clients) offered fewer types of services than larger providers; those serving more than 10 such clients were similar in the range of services offered.

- Minority Composition. Overall, 80% of all staff and clients in the 100 providers were white (non-minority). However, larger providers were found to have larger proportions of both minority staff and minority clients.

- Formal Evaluations. While 63% of all providers conducted evaluations within the last five years, all of those providers serving more than 200 severely handicapped clients performed evaluations.

- Parent Involvement. Larger providers had higher levels of parent involvement.

7.1.3 Handicapping Condition Served

There were pronounced differences in the characteristics of providers serving primarily mentally retarded, emotionally disturbed and deaf-blind populations. The other two groups (those serving primarily multiply handicapped clients and those serving a mixed handicapped population) demonstrated characteristics that were more nearly average for the provider sample. For example, providers serving

primarily severely mentally retarded children and youth were likely to serve fewer than 10 such clients and to be privately controlled day providers. This places these providers in the smallest cells on both the control and size variables. However, this generalization concerning the differences among providers primarily serving various handicapping conditions has several exceptions. In a real sense the major finding concerning the relationship vis-a-vis primary handicapping condition served is that each handicapping condition was different from the other conditions. In such a situation, the conveying of the varied results is problemmatical. However, rather than ignore them, the decision was made to present the most important findings for each provider type of interest. Hence, in the following sections are presented the most important findings for selected variables. This detail should provide some feel for the major dimensions of the differences, as well as for some of the detail thereof.

Contrasts Between Providers Serving Primarily Mentally Retarded Clients and Other Providers

- Educational/Habilitative Services. These providers were among the least likely to offer educational/habilitative services; in general, they offered fewer services than other types of providers, except in the area of support services.

- Educational Approach. Of these providers, 94% have changed over the past five years in their educational approach.

- Staff-Client Ratio. There was a low staff-client ratio of .56 per client served compared to the overall mean of .86.

- Overall Quality. Day providers serving large numbers of mentally retarded clients were of relatively high quality. Residential providers serving primarily mentally retarded clients were the lowest quality group of providers studied.

- Formal Evaluations. A relatively high percentage used results of formal evaluations to measure client progress; a relatively low percentage used results to develop instructional programs.

Contrasts Between Providers Serving Primarily Emotionally Disturbed Clients and Other Providers

- Cost. On all cost variables, the costs of providers in this group were the highest of all provider groups.

- Overall Quality. These providers had the highest quality rating, especially for residential providers.
- Provider Specialization. Such providers rarely had mandates to serve other types of disability; they often specialized in the severely handicapped, with only 19% having mandates to serve all severity levels.
- Staff-Client Ratio. The overall staff-client ratio was high for this group of providers, with .997 staff for each client served. Higher than average ratios occurred in the staff categories of therapist, social worker, psychiatrist, certified and non-certified teachers, administrator, and "other."
- Parents. A relatively high percentage of client parents were involved in service planning/delivery and there was a high level of parent visitation noted.
- Formal Evaluations. These providers were most likely to use results of formal evaluations to evaluate program components; they were also well above average in the application of other possible uses of evaluation results.
- Physical Facilities. 75% of these providers have seen significant change in physical facility size over the past 5 years.
- Deinstitutionalization Rates. A high average of 54 clients per provider were discharged in a year; client age was a major factor in the discharging of clients.
- Length of Stay. The average enrollment period for providers serving emotionally disturbed clients was significantly shorter than that for other handicapping conditions.

Contrasts Between Providers Serving Primarily Deaf-Blind Clients and Other Providers

- Overall Quality. Day providers were lowest in quality among day providers; residential providers were among the highest quality residential providers.
- Scope of Clientele. Providers serving primarily deaf-blind clients often had mandates to serve other disability groups (the reverse was not generally true).
- Staff-Client Ratio. The staff-client ratio was 1.02. High staff-client ratios existed for the categories of certified and non-certified teacher and attendant; ratios were well below average for all other staff categories.
- Parent Visitation. There was a high rate of parent visitation.

- Length of Stay. A high average enrollment period was noted. For example, an average of only 1 client was released in the 11-month period from July 1, 1973 to June 1, 1974.
- Formal Evaluations. Only 71% of the providers conducted client assessments; 70% of those assessing clients used the same assessment procedures for all clients. 100% of these providers used evaluation results to develop instructional programs; a relatively low number used these results to measure client progress.
- Educational Opportunity. These providers showed the highest levels of educational opportunity, staff-client interaction, and training and evaluation; they were considerably lower than others in terms of client movement out of the provider.
- Discharge Factors. Functional deterioration or improvement were both very common reasons for discharge from providers serving deaf-blind clients. Among residential providers, family removal of the client was never cited as a reason for release.
- o Deinstitutionalization Settings. Clients released from day providers were far more likely to be released to another institution caring for the handicapped than to a community setting; residential deaf-blind clients were more likely to be released to their parents than was any other type of client.

7.1.4 Selected Summary of Observational Data

The observational data, collected in 99 providers in a variety of settings and frequencies, is presented in Chapter 4. Overall, the observational data noted a number of differences between day and residential providers.

- Educational Technique. Behavior modification techniques were being utilized more frequently in day providers.
- Activity Level. In 22% of observations in residential providers there was no definable activity at all occurring in the setting.
- Grouping Patterns. Residential providers had more settings in which severely handicapped clients were grouped homogeneously.
- Range of Materials. Residential providers had no play materials for clients in 14% of observations and in general, those materials available in residential providers tended to be in poorer condition and of a lower quality than the day or mixed providers.

- Observed Behavior. "Inner-directed Behaviors" and "Negative Affect--Aggressive Behaviors" were observed much less frequently in the day providers than in either residential or mixed providers. "Staff-Client Interactions during Instruction" were more frequently observed in day providers.

7.1.5 A Note About Some Important Non-Findings

The focus of a summary of major findings normally precludes a discussion of relationships that were not observed. However, it is important to note that certain variables did not appear to be important in the various analyses conducted in the course of the study.

The primary variable in this particular area is the provider control variable. Whether the provider was privately or publicly controlled showed few relationships to other variables. Other than the obvious sources of funding differences and tendency for private providers to be considerably smaller than public providers, there were few differences.

This variable, the characteristics of staff, and several other variables did not seem to be correlated either in the univariate or multivariate analysis. This lack of relationship represents an important non-finding associated with the study.

7.2 Summary of Findings Relating to the Cost of Care for Severely Handicapped Children and Youth

The cost analysis reported in Chapter 5 of this volume was based on standardized cost data collected from the providers under study. Personnel costs were determined on the basis of an allocation of staff time into seven service areas. Consequently, it is possible to estimate the standardized personnel costs for various staff types and service areas. All personnel costs are reported on a per childweek basis (the expenditure per severely handicapped client per week). In addition to the personnel cost information, data were collected concerning non-personnel costs and the funding sources of providers.

7.2.1 Personnel Costs

Table 7-1 summarizes the per childweek personnel costs for providers, separated into costs for educational/habilitative services, basic care and program administration. Average costs for day, mixed, and residential

Table 7-1

Average Standardized Cost Per Childweek
by Provider Type and Aggregate Service Area:
Personnel Expenditures

	Aggregate Service Area			
Provider Type	Educational/ Habilitative	Basic Care	Administration	TOTAL
Day	$48.48	$12.91	$18.07	$79.46
Mixed	53.50	55.26	30.94	139.70
Residential	94.93	82.43	24.94	202.30
Average for all Providers	$66.52	$45.66	$23.10	$135.28

providers in these categories are reported on separate rows of the table. From this table we may see that the average personnel expenditure for the 95 providers from which valid cost data were available was $135.28 per child-week. Day providers spent less than this amount and residential providers spent more. Overall, about half of all personnel costs were expended for educational/habilitative services ($66.52 per childweek). Residential providers spend nearly twice as much per childweek for educational/habilitative services than day providers. This difference is consistent over all staff categories except administrator and teacher aide. That means that residential providers spent more than day providers on certified teachers and other "habilitative" staff types (e.g. psychologists, therapists, social workers, etc.)per childweek.

Another dimension of providers we have considered is the primary type of clients served. We compared providers who served primarily emotionally disturbed clients with all other providers and found that those providers serving emotionally disturbed clients spent about $40 per childweek more on personnel costs than all other providers ($169.64 vs. $128.08). Providers serving emotionally disturbed clients also spent more for educational/habilitative services than other providers ($82.60 per childweek vs. $62.47).

The largest expense for any type of staff was for certified teachers ($35.68 per childweek), followed by $20.46 for attendants and $20.17 for administrators. Day providers spent approximately the same amount for certified teachers ($35.27), followed by $16.11 for administrators and $11.59 for teacher aides. Residential providers also spent the largest share of their personnel costs on certified teachers ($41.57), followed by $41.15 for attendants, $25.95 for support staff and $23.95 for administrators. In mixed providers, the largest personnel expenditure was for attendants ($28.57), followed by administrators ($27.17), support staff ($25.07) and certified teachers ($24.59). Providers serving primarily emotionally disturbed clients spent the largest portion of their personnel costs on administrators ($34.62), with therapists second ($31.74), and certified teachers a distant third ($20.42).

In general, the largest share of all personnel costs was attributed to the provision of educational/habilitative services. The staff categories in which the largest expenditures were made are certified teachers, attendants

and administrators. Residential providers had larger per childweek expenditures for both educational/habilitative services and basic care than was observed for either day or mixed providers. Those providers serving primarily emotionally disturbed clients had higher personnel expenditures than other types of providers.

7.2.2 Funding Data

The providers studied obtained the great majority (over 80%) of their funding support from public sources: state, federal and local governments as well as welfare programs. Residential and mixed providers had state sources as their primary funding agencies, while day providers had approximately equal contributions made by state and local sources. All three types of providers received about 15% of their funds from federal programs. Payments by families of severely handicapped clients accounted for very little of the total funding, ranging from 1% (day) to 8% (residential). However, parents paid some fee in over half of all providers.

7.2.3 Nonpersonnel Expenditures

An estimate of the actual dollar expenditure for nonpersonnel costs was obtained in the course of the cost analysis. Overall, nonpersonnel costs accounted for less than 25% of the total costs of a provider. Table 7-2 contains a summary of the non-personnel expenses per childweek for providers. Again, the cost of a day program was significantly less than that of a residential program. The nonpersonnel costs of day and residential providers serving primarily emotionally disturbed clients were only slightly higher than those of other providers (by about $5 per childweek). The exceptionally high nonpersonnel costs observed for mixed providers cannot be easily explained. Given the small number of such providers (18) and the problems with the non-personnel cost data discussed in Section 5.7, this result should not be considered important.

Table 7-2

Average Standardized Costs Per Childweek
by Provider Type: Nonpersonnel Expenditures

Provider Type	Total Dollars
Day	$24.56
Mixed	74.13
Residential	41.64
Average for all Providers	$40.10

7.3 Summary of Major Findings Relative to the Relationship Between Cost and Quality

Results of the study point to a complex relationship between cost and quality. The eighteen quality indices were individually related to costs in different manners. Four of the variables were generally positively related to costs:

- High percentage of staff time spent on educational/habilitative tasks,
- Personal possessions,
- Staff development opportunities, and
- Evidence that clients receive educational/habilitative services after discharge from the provider.

In contrast, parental involvement with their child was observed to be negatively related to costs.

It was found that the quality ratings on four indices could be theoretically increased in the low and medium quality institutions by changing the pattern of expenditures across the three aggregate service areas without adding additional resources nor necessarily decreasing other quality indices.

- Range of educational/habilitative materials,
- Instructive staff behavior,
- Parent involvement with the provider, and
- Respect for clients.

Three mediating variables were found to be strongly correlated with average standardized costs per childweek.

- Whether the provider was serving primarily emotionally disturbed clients or not,
- The number of severely handicapped clients in the provider, and
- The total number of clients served by the provider.

With the important exception of the rapid deterioration of quality ratings when large numbers of severely handicapped clients were concentrated in larger providers, these variables were positively related to the quality ratings. However, the introduction of these mediating variables, through regression procedures, did not affect the basic relationships between

cost and quality noted above. However, it must be emphasized that the relationship between cost and quality varied markedly across day, residential, and mixed providers. Details of these relationships can be found in Chapter 6.0.

8.0 POLICY IMPLICATIONS OF THE STUDY

The purpose of this chapter is to analyze the major study findings from the perspective of those charged with decision making in the area of programs for the severely handicapped youth. Since the primary unit of analysis in this study is the provider, the policy implications of the study are at this level.

The majority of the policy implications of the study are in the cost of providing quality care to severely handicapped youth. Hence, the policy implications will begin with an estimate of the costs of providing various levels of quality care to severely handicapped youth. However, in order to obtain these estimates, we must first estimate the total numbers of severely handicapped youth in the U.S., and, more importantly, that portion of these currently in providers. The generation of such an estimate is worthy of a study in itself, and was not the focus of this study. Nevertheless, given the need for such estimates, Section 8.1 will discuss the problems of estimating the number of severely handicapped youth, and will then briefly present our best estimate concerning the numbers of severely handicapped youth. These estimates and a series of assumptions will be employed in Section 8.2 to generate estimates of the costs of increasing quality which will then be discussed in Section 8.3.

The next Section, 8.4, of this chapter will present the policy implications of the major findings of the study not in the area of costs. In closing, we will briefly discuss some recommendations for future research.

8.1 Estimating the Total Population of Severely Handicapped Youth in Providers

The two main techniques which have been used to obtain estimates of the number of handicapped children and youth in the U.S. are (1) direct surveys of a selected population to determine the actual number of persons fitting certain categories, or (2) the application of standard percentages which are applied to population figures to yield numerical estimates. These two techniques are often combined and percentages which were derived from previous surveys are applied in the absence of actual survey results. Theoretically, it would be possible on the basis of accurate surveys to obtain percentages which could then be used to extrapolate the numerical estimates to various subpopulations of interest. Unfortunately, the previous application of both

techniques has suffered from several problems. Because the two techniques are so closely related, most of these problems apply to both techniques. These general limitations are described briefly below in order that the estimates presented in the next section are not misinterpreted in terms of accuracy.

- The definitions of "handicapped" vary considerably across studies.
- Most estimates do not indicate percentage which is severely handicapped.
- The actual censuses which exist vary in terms of the specific disabilities included (e.g. only deaf, only mentally retarded, etc.); the populations surveyed (e.g. only school populations, total population excluding institutions, only institutions, etc.); the time at which the survey was conducted; the definitions used; the techniques for obtaining data (personal interviews with families, interviews with teachers, agency surveys, etc.).
- The actual prevalence of certain disabilities seems to vary with certain characteristics not necessarily taken into account in, for example, the percentage estimators used: e.g. certain disabilities are more common for inner city and poor areas than for rural areas.
- Tendencies exist to overestimate handicapped population when the group providing the estimate hopes for increased funding: either a local school district or program hoping for additional (excess cost) funds, or a private agency particularly concerned with the problems of a specific disability group (e.g. deaf).
- Tendencies to underestimate result from reluctance on part of certain groups -- particularly families -- to admit to a census taker that there exist certain problems within their family.
- Many estimates rely on the "professional judgment" of the people providing information, rather than on specified objective guidelines.
- Children with more than one handicapping condition can easily be counted in more than one category -- thus resulting in over-counting.

Given these major methodological and definitional problems, a search of the literature produced three publications that were useful in estimating the total number of severely handicapped youth in the U.S. and in providers.(*)

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* The three sources were: Ford, Nelson, Survey of the Costs of Educating Handicapped Pupils. Draft of Report prepared for HEW Office of the Assistant Secretary for Planning and Evaluation, 1976. One Out of Ten; School: Planning for the Handicapped, Educational Facilities Laboratories, New York, 1974. Sage, Daniel D., and Riley, D., The Bounty Hunters: The Financial Issue in Education of Children with Disabilities, Human Policy Press; Syracuse, New York, 1974. The 1970 U.S. Bureau of the Census estimates were not used because of the lack of currency of these estimates and the definition employed therein.

The most recent and detailed of these estimates is provided by Nelson Ford (1976). Using the estimates provided in this report, the total population of severely handicapped youth would be in the area of 350,000. The remaining sources, as well as the census, produced population estimates of from 250,000 to 700,000. It is interesting to note that both the data from this study, and the various estimates found in these publications concur in estimating that approximately 70% of the total severely handicapped youth are currently in some type of provider situation.

8.2 The Costs of Increasing Quality for Severely Hardicapped Youth Already in Providers

The estimation of the costs of increasing quality for severely handicapped youth already in providers was accomplished through a combination of study results and five necessary assumptions.* The assumptions are discussed in detail below. These estimates resulted from the application of the assumptions to the study's findings and are summarized in Table 8-1.

Assumption One:

The title of this section implies an important policy implication of the study. The analysis presented in Section 6.3 examined the question of whether increases in quality could be brought about by changing the expenditure patterns within providers across aggregate service areas without an increase in the total cost of care. Of the eighteen quality indices, four were found where some small increase in quality could be achieved by changes in expenditure patterns. However, as was pointed out in that analysis, the increases in quality would be relatively small and would move few providers the full step from low to medium or medium to high quality. Hence, the analysis in this chapter starts off with an important assumption: To achieve significant increases in quality in providing services to severely handicapped youth, additional resources will have to be brought to bear. Reallocation of current levels of expenditures will not significantly increase quality levels.

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*Estimates for both the numbers of and costs of care of those severely handicapped youth not in providers cannot be extrapolated from study data. For example, this population may be more expensive to care for because of a lack of geographic proximity to existing providers.

TABLE 6-1

LOW AND HIGH ESTIMATES OF TOTAL COSTS
(IN MILLIONS OF DOLLARS)
OF RAISING QUALITY FOR SEVERELY HANDICAPPED YOUTH
IN PROVIDERS PER YEAR: PERSONNEL EXPENDITURES (*)

Estimate of Total Number of Severely Handicapped Youth In Providers	Estimate of Total Number of Severely Handicapped In Providers with Low Quality Environments	Estimates of Cost of Raising from Low to Medium Environments Per Year		Estimates of Cost of Raising from Low to High Environments Per Year		Estimate of Number of Severely Handicapped Providers with Medium Quality Environments	Estimates of Cost of Raising from Medium To High Environments Per Year		Estimates of Total Cost of Raising All Provider Environments to High Quality Per Year	
		$2,860**	$6,760**	$5,460**	$13,010**		$2,600**	$6,240**		
150,000	31,500	90	212	172	410	54,000	140	337	312	747
175,000	36,750	105	248	201	478	63,000	164	394	365	872
200,000	42,000	120	284	229	546	72,000	187	449	416	995
225,000	47,250	135	319	258	615	81,000	211	505	469	1,120
250,000	52,500	150	355	287	683	90,000	234	562	521	1,245
275,000	57,750	165	390	316	751	99,000	258	617	573	1,370
300,000	63,000	180	426	344	820	108,000	281	674	625	1,494
325,000	68,250	195	461	373	888	117,000	305	731	677	1,619
350,000	73,500	210	497	401	956	126,000	328	788	729	1,744
375,000	78,750	225	532	430	1,025	135,000	351	842	781	1,867
400,000	84,000	240	568	459	1,093	144,000	374	899	833	1,992
425,000 (***)	89,250	255	603	487	1,161	153,000	398	955	885	2,116
450,000	94,500	270	639	516	1,229	162,000	421	1,011	937	2,240

(*) The estimates of total populations comes from sources exterior to this study. The estimates of costs and the percent of severely handicapped youth in Low and Medium Quality environments were generated from study findings.

(**) These estimates were derived as described in Chapter 6. The lowest and highest plausible values for the low to medium step ($55 and $130) and for the medium to high step ($50 and $120) costs per average standardized childweek were multiplied by fifty-two.

(***) Given study data and definitions, it is highly unlikely that there are more than 425,000 severely handicapped youths in providers.

Assumption Two:

A second important assumption employed in the coming analysis centers on the important observation made throughout Chapter 6.0. Specifically, not all of the eighteen quality indices are sensitive to increases in expenditures. Certain of the indices, for example, parental involvement in the provider, do not appear to be necessarily sensitive to increases in expenditures. These results suggest that those interested in increases in quality in such indices, must not necessarily look to increases in resources.

Assumption Three:

Another assumption, based on study data contained in Table 8-1, is in the area of the percent of the total number of severely handicapped youth in providers that are in low and medium quality environments. There were several ways in which these estimates could have been calculated using study data. For example, we could have defined a severely handicapped youth to be in a low quality environment if that youth were in a provider that received a low rating on any one of the 18 quality indices. This approach would have had the vast majority of the population in low quality environments. After considering this and a variety of other approaches, it was decided to define low quality environments as a situation wherein more than four of the eighteen quality indices were rated as low for the provider. This approach led to the definition of 21% of the total severely handicapped youth in the study's sample being in low quality environments. This is a very conservative approach to classification of the clients, but masks the fact that a larger percentage (38%) of the providers were low quality environments. This resulted from the fact that many of the smallest providers were of low quality. A similar assumption was employed to develop the estimate of the percent of severely handicapped youth in medium quality environments. Specifically, it was assumed that if more than six of the quality ratings received by the remaining (non-low) providers were medium, the severely handicapped youth was in a medium quality environment. This resulted in an additional 36% of the children (in 28% of the providers) and youths were in medium quality environments. Thus, a total of 33% of the severely handicapped children and youths were in high quality environments (in 32% of the providers) by this definition.

Assumption Four:

The analysis of the costs of increased quality was done at an aggregate level. The differences between provider types, handicapped conditions served, and provider size will be aggregated to the most general levels. This aggregation assumption is necessitated by the complexity of the interrelationships detailed in the previous chapters. To provide disaggregated estimates of the costs of increasing quality, for example, in day versus residential providers, would require both more cases than were available for this study and even more assumptions than those necessary for this aggregate analysis. However, it should be emphasized that this aggregate analysis is limited to those quality indices that were observed to be positively related to expenditures. In addition, it must be added that this summary analysis does not imply that additional resources is necessarily a preferable policy alternative to altering the provider population itself. Specifically, the analysis in this chapter assumes the provider population as a given. Whether it would be preferable or more efficient to, for example, "discourage" through policy guidelines small providers since they tended to be poorer in quality, cannot and should not be inferred from the analysis in this chapter.

Assumption Five:

Table 8-1 presents the overall estimates generated by the study. The estimates of the total number of severely handicapped youth in the U.S. and currently in providers, were generated in Section 8.1. The remaining data in the table was generated using the ratio of severely handicapped clients observed in the study, and the cost estimates achieved in Chapter 6.0. It should be emphasized that the cost estimate numbers employed makes the assumption that the cost of changing the individual quality indices is not simply additive. Specifically, it is assumed that to increase two quality indicators, does not necessarily mean that the cost is a simple sum of the two-step cost estimates. Hence, the cell entries in Tables 6-1 through 6-4 are the basis for the yearly estimates in Table 8-1.* The

*The Reviewers of this chapter frequently questioned the lack of reliance on the regression estimates and weights developed in Section 6.2 for the construction of the estimates in Table 8-1. These regression estimates were inappropriate for this analysis because of the data transformations and a number of other considerations, e.g., standardization of the data, aggregate scaling of the Quality indices, etc.

specific low and high numbers employed were developed by making the "best" and "worst" possible assumptions. Specifically, the assumption that the smallest and largest observed step cost, from low to medium, and from medium to high, for total cost per average standardized childweek was the actual cost of increasing quality. Hence, the estimates of cost to increase quality employed in the table represent the highest and lowest observed possibilities in the study results.

8.3 Toward Interpretation of the Estimates

The results of these assumptions are the estimates contained in Table 8-1. The full range of possibilities in terms of population estimates has been included for those willing to make other assumptions concerning the population size or the percent of population in providers. Our best estimate has been shaded for emphasis. As the estimate indicates, our best estimate is that it would cost between $521 and $1,245 million per year to raise all severely handicapped youth currently in providers to high quality environments.

How does this estimate compare to the expenditures observed in the study? Overall, we observed in Table 5-1 that the average provider was spending $7,020 ($135 x 52) per year per child. In Table 6-1 we observed that low quality providers on the four cost indices sensitive to increases in expenditures were averaging $3,917 per year per child and high quality providers were averaging $8,212 per year per child. The results presented in Table 8-1 are not exactly comparable to those presented in Table 6-1 because the later Table focuses on ranges and the former on means. However, they can provide the following approximate comparison: The results suggest that in order to bring the low quality providers to high quality the expenditure level within these providers would have to be increased from its current average of $3,917 to between $9,377 and $16,927 per child per year.* This range compares to the average for observed high quality providers of $8,212 per child per year. These results are intuitively acceptable.

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*Reviewers of this study frequently questioned whether the per year and child estimates could be combined with the discharge data to calculate the cost per case of providing high quality services to severely handicapped children and youth. For a multitude of reasons, most importantly, the observed mobility of clients across provider types and the measurement of discharge within this study, these estimates cannot be calculated from the data available within this study.

For example, these estimates reflect the reality of what it would cost to increase quality within smaller providers which were generally of lower quality on a per case basis. These comparisons are not exact. However, these comparisons do coincide with a basic finding of much of the research surrounding attempts to increase quality within natural settings. Specifically, the increasing of quality within natural settings usually requires more expenditures than the settings that reached high ratings in a natural manner. These additional expenditures are required to "overcome" the factors which impede the achievement of high quality environments.

It should be emphasized that the interpretation of these estimates must be limited to those quality indices that are "sensitive" to increments in resources. Those wishing to "raise" ratings of other quality indices must look elsewhere.

One final note to methodologically-inclined readers must be added. The estimates generated in this section can be criticized for being aggregate in nature, because the procedures that we use ignore the complexity of the observed relationships. However, by reducing the relationships to the most aggregate level, (that is, the total expenditures per average standardized childweek), we have forced the results in a conservative direction. The estimates are conservative because the complexity of the relationship of cost and quality through third variables such as size of provider is allowed to suppress relationships. (The "partialing" or "controlling" of such third variables almost always enhances the relationship between the independent and dependent variables. Hence, the estimates contained in Table 8-1 are essentially upper bounds if one accepts the assumptions that go into the estimation process.)

8.4 Other Policy Implications

In addition to the important findings outlined in the area of the relationship between quality and cost, there were three additional important policy implications of the study for those making decisions concerning programs for severely handicapped youth.

Quantitative and Qualitative Differences Between Provider Types

The three types of providers studied were different in many of the relationships among key variables. Residential providers in the study were

generally four hours/seven days a week/ year round programs, whereas the day providers operated for part of a day, usually five days a week, and often were operative only during a regular school year. Mixed providers varied. Some were basically residential providers which offered a day service as well as a different group of severely handicapped children and youth; a few were really a service delivery system or at least a cluster of different programs some of which only offered residential care. Thus, although uniform information was obtained on these three different provider types, it is extremely difficult to make exact comparisons. There are, however, a few comparisons which can and should be made within explicit limitations of the data.

Our data indicate that during an operating week, residential providers offer more educational and habilitative services to severely handicapped clients than do day providers, but not a very large amount (28 versus 25 hours per week). It is important to note that for clients in residential providers, this amount represents the total amount received during an average week, whereas for clients in day providers it is only the amount received while in the structured program studied. There is the definite possibility, then, that clients in day providers receive educational and habilitative services when at home or in their residential setting. The providers offering the greatest amount of educational and habilitative services were the mixed providers. These providers offer severely handicapped youth structured programming in the residential settings as well as in the "day" settings.

In sum, if the amount of educational and habilitative services offered a severely handicapped client is a primary goal of a policymaker or program planner, then it appears that mixed providers offer the most; residential providers offer the next highest number of hours; and, day providers offer the least but allow for additional educational and habilitative service for the client outside of program hours (from the parents or other sources). The formulation of any general policy in the area of programs for severely handicapped youth should begin with the realization of the qualitative and quantitative differences between these provider types.

The Non-Importance of Public/Private Status

An important "non-finding" of the study centers on the lack of differences found between comparable public and private providers. Although private providers exhibited some pronounced tendencies, for example, to be smaller than public providers, the lack of differences along this dimension should not be overlooked by those making policy decisions.

Provider Size and Number of Severely Handicapped Youth

The results of this study suggest that the total size of the provider and the number of severely handicapped youth served in the provider are positively related to quality. However, an important caveat that should not be overlooked is that beyond a certain size, on both of these size dimensions, quality deteriorated rapidly. Hence, it would appear that large institutions with large concentrations of severely handicapped youth may not be ideal provider environments for care of severely handicapped youth.

Within this study these variables were observed to be important correlates of cost, quality, and a variety of other variables. Within the context of the analysis conducted for this study, they were treated as mediating variables. For policy purposes this need not be the case.

8.5 Suggestions for Future Research

The purpose of this study was exploratory, and little expectation was had that information obtained would be generalizable to all providers of services to severely handicapped youth. However, in the future, if research is conducted on the types of services which are offered, the costs and quality of care, an effort should be made to ensure the generalizability of the results. To ensure this, improved information will have to be obtained on the total population of both providers and on the total population of severely handicapped youth.

Research should be conducted on services provided to severely handicapped youth using an approach which focuses on the individual not on providers. Moreover, information should be obtained on all the services received by a severely handicapped youth from all sources not just the major providers. One of the limitations of the current study was its focus on providers of care, making it virtually impossible to compare, for example, the true or total costs of services received by clients in day versus residential providers.

If additional research is conducted on the providers themselves, improvements could be made in many of the details of the study. Perhaps the two most important improvements would be in the cost and quality data. Better cost and quality data would require that considerably more time be spent visiting each provider than was possible within the resource constraints of the current project. For example, more in-depth information should be obtained on the non-personnel costs. These costs are difficult to determine, particularly for many of the providers of service to severely handicapped youth where many expenditure items are not direct. For instance, the cost of space can vary from straightforward rent, to donated space in a church, to buildings which are owned outright by the state, to mortgage payments on a private home only a part of which cover space which are used by the clients.

The information collected in this study on the costs of different services was based primarily on staff estimates of how they allocated their time. If more accurate information were desired, staff would need to log or record their time -- a tedious process which itself could potentially interfere with the delivery of services. In sum, there are many ways in which improved cost data could potentially be useful, but it must be recognized that obtaining this data can be quite expensive and time-consuming.

The second aspect where considerable improvement could be made is in the quality of information. Many efforts have been made to develop evaluative standards for the providers of care to handicapped people. For example, the Joint Commission on Accreditation of Hospitals had developed extensive guidelines for residential and community agencies serving mentally retarded persons. Wolfensberger and Glenn have developed the PASS (Program Assessment of Social Services) system which focused largely on a process evaluation of human services. Extensive efforts have been made to develop measurement techniques for determining the learning and developmental progress of a severely handicapped person. Future research could attempt, as was attempted in this study, to develop relatively simple surrogate measures for program quality, but undoubtedly will encounter many of the same problems: lack of external validity and internal reliability. As with cost data collection, to obtain a complete picture of provider quality through the application of JCAH, PASS or similar standards is expensive and time-consuming.

Such research, using better definitions, selected from a known universe to ensure generalizability, taking a total view of all needs and services provided to severely handicapped youth, and obtaining in-depth cost and quality data does not now exist. However, before recommending that it be undertaken, policymakers must first clearly define their questions. Decisions must be made about the specific research needs. Undoubtedly, a combination of different types of research should be undertaken, some of which is relatively limited in scope but which can provide policymakers with relatively useful information in a short time period; other longitudinal research should be considered.

Lest this closing section be misinterpreted, the study staff feels that the current study, although exploratory in nature, resulted in measurable and important increases in our understanding of the care of severely handicapped youth.

APPENDIX A

TABLE OF PROVIDER CHARACTERISTICS

Notes to the Reader of Appendices A and B

As an introduction to Appendix A: Tables of Provider Characteristics and Appendix B: Costs of Provider Services to Severely Handicapped Children and Youth, some technical notes on the method of presenting results are in order. Each variable reported for the 100 providers will be analyzed in an identical manner (except where this is impossible due to the nature of the variable itself) through the use of two consecutive tables. The first analysis in each sequence (Table a)* will be a one-way analysis of the variable broken down by four other descriptive variables, presented horizontally in each table:

- Type of provider (day, residential, or mixed);
- Size of severely handicapped population in the provider (fewer than 10, 10 to 50, 51 to 200, and more than 200 severely handicapped clients);
- Client characteristics (mentally retarded, emotionally disturbed, deaf-blind, multiply handicapped, and mixed handicapping conditions); and
- Control (public or private).

These variables are defined exactly as they were for the case study volume of this report (Volume 4). The reader will note that the type of provider and client characteristics variables reported here are the same variables used to describe providers in the case studies. These definitions were restated in Chapter 2 of this volume.

The data for the dependent variables (presented on the vertical side of each table) are in one of several possible forms. The number reported in a table may be:

- The percentage of providers having a certain characteristic (e.g., offer residential services);
- The average percentage of an institutional characteristic, averaged over all providers of a particular type (e.g., the average number of white clients or staff); or
- An average of provider characteristics, averaged over all appropriate providers (e.g., the average size of the total client population, or average annual per capita costs).

To simplify presentation, the number of providers in each cell of the table is not reported. Due to variation in response frequency and quality, the responses for some providers are not available (or appropriate) and are therefore not reported. While there is a base of 100 providers, several may not have responded to a particular question; therefore, the reported percentages for any item are based on the number of valid responses only. The basic frequency distribution for the 100 providers is presented in the first set of tables of Appendix A.

The second method of presentation used for each variable presented (Table b) is a two-way breakdown of each variable. The independent variables for this procedure in each case are provider type (day, residential, or mixed) and client characteristics (mentally retarded, emotionally disturbed, deaf-blind, multiply handicapped or mixed). The average frequency, etc. of each dependent variable for each type-characteristic subgroup is presented as the cell entry in the table. Through this, the quality of, for example, day providers for mentally retarded children and youth may be compared with those of day providers for emotionally disturbed clients or with residential providers for the mentally retarded.

One final technical point which applies to the following tables is that sets of variables which one would expect to add to some number (100% for example) occasionally do not. In some cases this is due to rounding error. In other cases, the basis for computing one of a set of variables may be somewhat different than that used in computing another.

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*Tables 2-21 listed above are actually a series of two tables each, e.g., 2a and 2b. Table "a" contains four one-way breakdowns of the variables contained in the table by the four major independent variables: provider service type, provider size, provider client type, and provider control. Table "b" contains a two-way breakdown of the table variables by provider service type and client type.

Table A-1a Distribution of 100 Providers on Four Primary Variables (One-Way)

1.	DAY	RESIDENTIAL	MIXED		TOTAL
	43	38	19		100
2.	<10	10-50	51-200	>200	TOTAL
	24	33	30	13	100
3.	MR	ED	DB	MH	MIXED	TOTAL
	17	21	7	24	31	100
4.	PUBLIC	PRIVATE			TOTAL
	47	53			100

Table A-1b Sample Distribution: Provider Service Type by Provider Client Type

	MR	ED	DB	MH	MIXED	TOTAL
DAY	10	8	3	10	12	43
RESIDENTIAL	5	9	4	6	14	38
MIXED	2	4	0	8	5	19
TOTAL	17	21	7	24	31	100

Table A-1c Sample Distribution: Provider Service Type by Provider Size by Provider Client Type

	MR	ED	DB	MH	MIXED	TOTAL
DAY						
<10	3	2	2	1	5	13
10-50	3	4	0	5	3	15
51-200	4	2	1	4	4	15
>200	0	0	0	0	0	0
Total day	10	8	3	10	12	43
RESIDENTIAL						
<10	3	2	1	0	5	11
10-50	1	4	1	3	2	11
51-200	1	2	2	1	3	9
>200	0	1	0	2	4	7
Total residential	5	9	4	6	14	38
MIXED						
<10	0	0	0	0	0	0
10-50	0	1	0	4	2	7
51-200	0	3	0	3	0	6
>200	2	0	0	1	3	6
Total Mixed	2	4	0	8	5	19
TOTAL						
<10	6	4	3	1	10	24
10-50	4	9	1	12	7	33
51-200	5	7	3	8	7	30
>200	2	1	0	3	7	13
Total	17	21	7	24	31	100

Table A-1d Sample Distribution: Provider Service Type by Provider Control by Provider Client Type

	MR	ED	DB	MH	MIXED	TOTAL
DAY						
Public	4	3	2	3	5	17
Private	6	5	1	7	7	26
Total Day	10	8	3	10	12	43
RESIDENTIAL						
Public	1	3	3	4	7	18
Private	4	6	1	2	7	20
Total Residential	5	9	4	6	14	38
MIXED						
Public	1	2	0	5	4	12
Private	1	2	0	3	1	7
Total Mixed	2	4	0	8	5	19
TOTAL						
Public	6	8	5	12	16	47
Private	11	13	2	12	15	53
Total	17	21	7	24	31	100

Table A-1e Sample Distribution: Provider Service Type
by Provider Location by Provider Client Type

	MR	ED	DB	MH	MIXED	TOTAL
DAY						
Urban	2	4	2	7	3	18
Suburban	4	4	1	2	5	16
Rural	4	0	0	1	4	9
Total Day	10	8	3	10	12	43
RESIDENTIAL						
Urban	1	1	1	1	1	5
Suburban	2	4	1	3	9	19
Rural	2	4	2	2	4	14
Total Residential	5	9	4	6	14	38
MIXED						
Urban	0	0	0	5	1	6
Suburban	1	4	0	1	2	8
Rural	1	0	0	2	2	5
Total Mixed	2	4	0	8	5	19
TOTAL						
Urban	3	5	3	13	5	29
Suburban	7	12	2	6	16	43
Rural	7	4	2	5	10	28
Total	17	21	7	24	31	100

Table 7-2a

Service Mandates

	Total	Service Type			Size				Client Type					Control	
		DAY	RES	MIX	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
% mandated to serve: - all disabilities	19%	21	24	5	25	16	17	23	31	14	0	4	32	21	17
- mentally retarded	39	46	38	26	43	36	30	58	85	5	29	21	63	41	37
- emotionally disturbed	33	38	38	15	43	36	33	8	8	75	14	8	42	24	41
- deaf/blind	17	16	16	21	14	18	26	0	7	5	85	21	8	31	4
- multiply handicapped	33	35	34	26	33	29	37	33	39	5	43	54	29	38	28
% mandated to serve all severity levels	46	50	47	32	54	44	37	54	50	19	43	42	65	53	39
% mandated to serve severely handicapped	65	70	57	71	40	68	86	67	90	70	71	66	45	54	75%

Table A-2b

Service Mandates

	MR	ED	DB	MH	MIX
DAY					
% mandated to serve:					
all disabilities	33	13	0	10	33
mentally retarded	75	14	33	30	67
emotionally disturbed	13	71	33	10	67
deaf blind	13	0	100	10	11
multiply handicapped	38	14	33	40	44
% mandated to serve all severity levels	44	25	67	60	58
% mandated to serve severely handicapped	86	86	67	57	56
RESIDENTIAL					
% mandated to serve:					
all disabilities	40	22	0	0	36
mentally retarded	100	0	25	33	60
emotionally disturbed	0	78	0	17	40
deaf blind	0	11	75	17	0
multiply handicapped	33	0	50	83	30
% mandated to serve all severity levels	60	22	25	33	71
% mandated to serve severely handicapped	100	56	75	67	29
MIXED					
% mandated to serve:					
all disabilities	5	0	--	0	20
mentally retarded	100	0	--	0	60
emotionally disturbed	0	75	--	0	0
deaf blind	0	0	--	38	20
multiply handicapped	50	0	--	50	0
% mandated to serve all severity levels	50	0	--	25	60
% mandated to serve severely handicapped	100	75	--	80	50%

Table A-3a

Client Population

	Total	Service Type			Size				Client Type					Control	
		DAY	RES	MIX	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
Average total population	162	71	218	268	50	95	157	665	135	66	270	162	214	236	99
Average number severely handicapped	86	39	92	181	7	25	87	385	93	52	39	90	113	121	56
Handicapping conditions of clients:															
- % mentally retarded	21%	21	23	19	24	19	17	30	68	2	0	3	37	18	24
- % emotionally disturbed	22	20	26	18	23	28	21	8	2	72	0	1	20	15	28
- % deaf/blind	6	6	9	5	12	2	10	1	0	0	76	3	3	11	4
- % multiply handicapped	48	50	42	51	41	47	48	61	29	21	24	89	51	55	41
- % other disability	3	4	0	6	0	4	5	0	1	5	1	5	1	3	3%

Table A-3b

Client Population

	MR	ED	DB	MH	MIX
DAY Average total population	70	34	96	106	60
Average number severely handicapped	36	28	42	57	[illegible]
Handicapping conditions of clients:					
% mentally retarded	56%	0	0	5	22
% emotionally disturbed	2	63	0	1	10
% deaf blind	0	0	77	0	1
% multiply handicapped	40	24	23	92	49
% other disability	2	13	0	2	3%
RESIDENTIAL Average total population	63	104	402	263	265
Average number severely handicapped	38	73	37	167	106
Handicapping conditions of clients:					
% mentally retarded	89%	6	0	0	25
% emotionally disturbed	3	79	0	0	18
% deaf blind	0	0	74	0	2
% multiply handicapped	9	16	25	100	56
% other disability	0	0	1	0	0%
MIXED Average total population	1150	55	--	147	580
Average number severely handicapped	512	54	--	74	322
Handicapping conditions of clients:					
% mentally retarded	74%	0	--	2	41
% emotionally disturbed	3	75	--	0	9
% deaf blind	0	0	--	7	9
% multiply handicapped	24	25	--	78	41
% other disability	0	0	--	13	0%

Table A-4a

Other Client Characteristics

	Total	Service Type			Size				Client Type					Control	
		Day	Res.	Mix	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
Sex															
-- % Male	63%	61	66	59	68	58	63	62	61	78	54	56	60	61	64
-- % Female	37	39	34	41	32	42	37	38	39	22	46	44	40	39	36
Race															
-- % White	80	77	81	83	87	86	71	71	80	80	69	81	81	77	82
-- % Nonwhite	20	23	19	17	13	14	29	29	20	20	31	19	19	23	18%
-- % Black	(14)	(18)	(12)	(10)	(10)	(10)	(20)	(21)	(13)	(15)	(26)	(12)	(14)	(17)	(12)
-- % Other	(6)	(5)	(6)	(6)	(3)	(4)	(9)	(8)	(7)	(5)	(5)	(7)	(5)	(6)	(6)
Average length of enrollment (months)															
-- Residential programs	65	--	60	76	79	59	65	63	60	25	116	74	79	72	59
-- Day programs	54	55	17	56	36	58	70	17	65	28	54	58	69	53	54

Table A-4b

Other Client Characteristics

	MR	ED	DB	MH	MIX
DAY					
Sex: % male	58%	78	62	57	56
% female	42	22	38	44	44
Race: % white	77	80	66	77	79
% nonwhite	24	20	34	23	21
% black	(20)	(18)	(31)	(14)	(16)
% other	(4)	(2)	(3)	(9)	(5)
Average length of enrollment (months):					
residential programs	--	--	--	--	--
day programs	71	32	54	53	62
RESIDENTIAL					
Sex: % male	69%	76	49	53	68
% female	31	24	52	47	32
Race: % white	84	81	71	83	82
% nonwhite	16	19	29	17	18
% black	(12)	(12)	(22)	(12)	(14)
% other	(4)	(7)	(7)	(5)	(4)
Average length of enrollment (months):					
residential programs	69	25	116	54	67
day programs	--	--	--	--	--
MIXED					
Sex: % male	59%	84	--	58	43
% female	42	17	--	42	57
Race: % white	91	81	--	83	82
% nonwhite	10	19	--	17	18
% black	(8)	(13)	--	(10)	(10)
% other	(2)	(6)	--	(7)	(8)
Average length of enrollment (months):					
residential programs	24	25	--	92	103
day programs	12	24	--	73	99

Table A-5a

Admissions

	Total	Service Type			Size				Client Type					Control	
		Day	Res.	Mix	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
Average Number of Applicants	43	32	53	50	12	20	77	90	33	44	9	31	64	35	50
Average % Accepted	71%	83	54	73	73	66	71	79	73	48	71	97	64	85	60%
Average Waiting Period (in months) -- Day Program	3.1	0	0	0	2.6	1.8	3.7	6.0	1.9	3.2	3.0	3.0	4.1	4.3	2.1
-- Residential Program	7.7	4.0	10.0	3.7	0.4	14.2	11.1	2.8	2.8	2.7	7.5	18.5	8.3	11.2	4.0

Table A-5b

Admissions

	MR	ED	DB	MH	MIX
DAY					
Average number of applicants	32	18	8	38	45
Average % accepted	84%	66	72	105	77%
Average waiting period (in months):					
day programs	3	5	3	4	3
RESIDENTIAL					
Average number of applicants	10	57	10	38	89
Average % accepted	35%	37	70	87	53%
Average waiting period (in months):					
residential programs	4	4	8	33	9
MIXED					
Average number of applicants	143	69	--	19	18
Average % accepted	95%	35	--	93	63%
Average waiting period (in months):					
day programs	0	0	--	1	0
residential programs	3	2	--	4	5

Table A-6a

Average Number of Clients Discharged Between July, 1973 and May, 1974

	Total	Service Type			Size				Client Type					Control	
		Day	Res	Mix	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
Total providers	26	11	37	37	2	9	42	75	13	41	4	19	33	34	18
Day programs	10	11	--	14	1	4	20	32	12	6	6	11	13	10	10
Residential programs	28	--	37	25	1	12	56	60	4	54	1	16	38	38	17

Table A-6b

Average Number of Clients Discharged
Between July, 1973 and May, 1974

	MR	ED	DB	MH	MIX
DAY Day clients discharged since July 1, 1973	10	8	8	18	7
RESIDENTIAL	5	76	1	31	36
MIXED Total clients discharged	44	79	—	11	83
Day clients discharged	34	3	—	2	40
Residential clients discharged	10	23	—	8	59

Table A-7a

Reasons for Discharge: Day Programs

	Total	Service Type			Size				Client Type					Control	
		DAY	RES	MIX	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
% clients left because maximum age reached	5%	7	--	0	17	5	4	0	10	14	0	0	2	8	4
% clients left because level of functioning improved	36	35	--	42	22	29	44	52	25	41	52	29	54	42	32
% clients died	7	7	--	1	0	5	9	2	0	8	4	6	9	7	5
% clients left because level of functioning deteriorated	8	8	--	6	20	6	7	0	7	10	28	7	6	4	11
% clients removed by family	14	12	--	23	2	19	14	18	16	7	16	17	14	12	15
% clients left because funding level reduced	2	1	--	7	0	0	5	0	2	0	0	5	0	0	4
% clients left for other reasons	28	30	--	22	40	36	19	28	41	21	0	35	14	28	28%

Table A-7b

Reasons for Discharge: Day Programs

	MR	ED	DB	MH	MIX
DAY					
% clients left because maximum age reached	12%	17	0	0	3
% clients left because level of functioning improved	20	31	52	26	59
% clients died	0	9	4	11	10
% clients left because level of functioning deteriorated	8	11	28	6	7
% clients removed by family	19	8	16	11	7
% clients left because funding level reduced	3	0	0	0	0
% clients left for other reasons	39	24	0	47	14
MIXED					
% clients left because maximum age reached	0	0	--	0	0
% clients left because level of functioning improved	50	100	--	33	9
% clients died	0	0	--	0	7
% clients left because level of functioning deteriorated	0	0	--	10	0
% clients removed by family	0	0	--	27	72
% clients left because funding level reduced	0	0	--	13	0
% clients left for other reasons	50	0	--	17	12%

Table A-8a

Reasons for Discharge: Residential Programs

	Total	Service Type			Size				Client Type					Control	
		DAY	RES	MIX	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
% clients left because maximum age reached	8%	--	7	10	6	8	8	14	3	4	0	14	9	9	7
% clients left because level of functioning improved	43	--	42	43	33	43	49	42	49	69	67	28	31	40	46
% clients died	11	--	13	7	17	9	4	15	5	0	0	13	19	9	13
% clients left because level of functioning deteriorated	12	--	9	17	12	22	10	1	0	12	14	13	12	13	10
% clients removed by family	9	--	9	8	11	8	8	9	17	11	0	8	7	8	9
% clients left because funding level reduced	2	--	2	1	2	0	4	1	0	0	0	1	4	0	4
% clients left for other reasons	15	--	15	14	16	10	17	18	29	5	0	22	13	18	11%

Table A-8b

Reasons for Discharge: Residential Programs

	MR	ED	DB	MH	MIX
RESIDENTIAL					
% clients left because maximum age reached	0%	5	0	13	7
% clients left because level of functioning improved	27	68	67	21	36
% clients died	4	0	0	23	21
% clients left because level of functioning deteriorated	0	12	34	3	7
% clients removed by family	25	8	0	7	8
% clients left because funding level reduced	2	0	0	0	5
% clients left for other reasons	44	5	0	29	9
MIXED					
% clients left because maximum age reached	0	0	--	14	15
% clients left because level of functioning improved	94	71	--	35	17
% clients died	7	0	--	5	14
% clients left because level of functioning deteriorated	0	5	--	21	25
% clients removed by family	0	19	--	9	3
% clients left because funding level reduced	0	0	--	2	0
% clients left for other reasons	0	4	--	14	26%

Table A-9a

Client Placement After Discharge from Day Programs

	Total	Service Type			Size				Client Type					Control	
		DAY	RES	MIX	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
% clients living at home	75%	72	--	82	59	72	79	85	75	82	21	79	69	76	74
% clients living with foster parents	4	4	--	1	0	9	1	2	1	3	0	0.2	11	8	0.5
% clients in group homes	2	2	--	3	8	0	0	6	1	7	0	0	1	1	3
% clients in nursing homes	0.3	0	--	1	0	0	0	3	0	0	0	0	1	1	0
% clients in Day institutions	12	15	--	0	19	6	16	0	14	6	79	11	8	9	14
% clients in another part of same facility	3	2	--	6	0	8	0	0	0	0	0	4	6	0	5
% clients in other living situations	3	2	--	8	0	4	4	5	2	1	0	6	3	2	4%

Table A-9b

Client Placement After Discharge from Day Programs

	MR	ED	DB	MH	MIX
DAY					
% clients living at home	73%	79	21	78	69
% clients living with foster parents	2	4	0	0.3	11
% clients living in group homes	0	8	0	0	0
% clients in nursing homes	0	0	0	0	0
% clients in another institution	17	7	79	19	9
% clients in another part of same facility	0	0	0	0	7
% clients in other living situations	0	2	0	3	4
MIXED					
% clients living at home	85	100	--	80	70
% clients living with foster parents	0	0	--	0	7
% clients living in group homes	6	0	--	0	12
% clients in nursing homes	0	0	--	0	11
% clients in another institution	0	0	--	0	0
% clients in another part of same facility	0	0	--	10	0
% clients in other living situations	10	0	--	10	0%

Table A-10a

Client Residential Placement After Discharge from Residential Providers

	Total	Service Type			Size				Client Type					Control	
		DAY	RES	MIX	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
% clients living at home	38%	--	36	42	31	41	46	30	22	60	84	35	26	36	39
% clients living with foster parents	12	--	12	11	17	9	11	12	19	10	0	15	9	12	11
% clients in group homes	12	--	7	21	0	9	11	26	12	6	17	3	21	17	7
% clients in nursing homes	7	--	9	3	0	3	4	20	8	0	0	7	11	13	0.2
% clients in another institution	22	--	21	23	23	31	23	7	32	17	0	35	14	14	30
% clients in another part of same facility	1	--	1	0	0	2	0	0	0	3	0	0	0	1	0
% clients in other living situations	8	--	12	0.2	19	6	5	5	7	5	0	3	14	3	12%

Table A-10b

Client Residential Placement After Discharge from Residential Providers

	MR	ED	DB	MH	MIX
RESIDENTIAL					
% clients living at home	6%	56	84	32	27
% clients living with foster parents	25	7	0	18	10
% clients living in group homes	0	4	17	8	9
% clients in nursing homes	13	0	0	16	12
% clients in another institution	46	23	0	20	16
% clients in another part of same facility	0	4	0	0	0
% clients in other living situations	11	7	0	7	19
MIXED					
% clients living at home	52	70	--	38	25
% clients living with foster parents	8	18	--	13	7
% clients living in group homes	37	10	--	0	52
% clients in nursing homes	0	0	--	0	9
% clients in another institution	4	1	--	48	7
% clients in another part of same facility	0	0	--	0	0
% clients in other living situations	0.2	0	--	1	0%

Table A-11a

Clients Receiving Educational/Habilitative Services After Discharge

	Total	Service Type			Size				Client Type					Control	
		DAY	RES	MIX	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
% clients discharged who receive educational/ habilitative services	77%	80	67	88	73	77	76	84	69	86	68	80	75	79	74
% clients discharged receiving educational/ habilitative services:															
- at local schools	39	49	31	38	18	37	53	31	32	68	43	26	33	36	43
- in special day programs	24	23	22	29	35	26	14	34	36	7	33	23	30	30	19
- at residential facilities	23	17	26	26	11	25	24	26	20	14	24	40	16	23	22
- at other settings	6	4	9	6	21	7	1	0	11	0	0	1	13	3	9%

Table A-11b

Clients Receiving Educational/Habilitative Services After Discharge

	MR	ED	DB	MH	MIX
DAY					
% clients discharged who receive educational/ habilitative services	63%	97	71	86	83
% clients discharged who receive educational/ habilitative services:					
at local schools	48	78	29	18	63
in special day programs	23	13	0	36	20
at residential facilities	24	8	71	20	8
at other settings	6	0	0	1	8
RESIDENTIAL					
% clients discharged who receive educational/ habilitative services	69	69	67	70	65
% clients discharged who receive educational/ habilitative services:					
at local schools	0	52	50	26	26
in special day programs	50	5	50	14	24
at residential facilities	25	18	0	58	23
at other settings	25	0	0	0	13
MIXED					
% clients discharged who receive educational/ habilitative services	100	99	--	81	84
% clients discharged who receive educational/ habilitative services:					
at local schools	42	84	--	34	6
in special day programs	59	3	--	14	61
at residential facilities	0	13	--	51	13
at other settings	0	0	--	1	20%

Table A-12a

Educational/Habilitative Services*

	Total	Service Type			Size				Client Type					Control	
		Day	Res.	Mix	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
% of providers offering educational/habilitative services	99%	100	97	100	100	97	100	100	100	100	100	96	100	100	98
% of severely handicapped clients receiving educational/habilitative services	97	98	94	98	100	97	95	93	99	100	90	97	95	96	98%
Hours per week severely handicapped clients receive educational/habilitative services	29	25	28	42	26	29	34	27	26	33	28	30	29	29	30

*That is, educational services, family services, and diagnois/referral services combined.

Table A-12b

Educational/Habilitative Services

	MR	ED	DB	ME	MIX
DAY					
% of providers offering educational/habilitative services	100%	100	100	100	100
% of severely handicapped clients receiving educational/habilitative services	99	[illegible]	77	100	100%
Hours per week severely handicapped clients receive educational/habilitative services	26	29	22	24	22
RESIDENTIAL					
% of providers offering educational/habilitative services	100%	100	100	80	100
% of severely handicapped clients receiving educational/habilitative services	98	100	100	91	89%
Hours per week severely handicapped clients receive educational/habilitative services	25	29	33	12	31
MIXED					
% of providers offering educational/habilitative services	100%	100	--	100	100
% of severely handicapped clients receiving educational/habilitative services	100	100	--	97	99%
Hours per week severely handicapped clients receive educational/habilitative services	28	47	--	44	40

Table A-13a

Services Offered

	Total	Service Type			Size				Client Type					Control	
		DAY	RES	MIX	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
% of providers offering:															
- educational/habilitative services	94%	100	90	90	92	97	97	85	88	91	100	96	97	94	94
- basic care	89	88	90	90	87	91	90	85	88	81	100	88	93	87	91
- medical services	51	44	55	58	33	42	63	77	35	38	29	58	68	55	47
- family and community services	82	95	68	79	71	88	83	85	77	81	57	88	87	85	79
- diagnosis/referral services	84	86	81	84	75	88	87	85	65	91	86	83	90	85	83
- administrative services	79	88	68	79	54	91	83	85	65	90	57	79	84	81	77
- support programs	77	61	90	90	54	82	83	92	82	67	71	88	74	79	76%

Table A-13b
Services Offered

	MR	ED	DB	MH	MIX
DAY					
% of providers offering:					
educational services	100%	100	100	100	100
basic care	90	88	100	80	92
medical services	50	0	33	70	50
family services	90	100	67	100	100
diagnosis/referral services	80	100	100	80	83
administrative services	80	100	67	90	92
support programs	80	38	33	70	58
RESIDENTIAL					
% of providers offering:					
educational services	80	89	100	83	93
basic care	100	78	100	83	93
medical services	0	56	25	67	79
family services	60	78	50	67	71
diagnosis/referral services	40	89	75	83	93
administrative services	40	89	50	67	71
support programs	80	89	100	100	86
MIXED					
% of providers offering:					
educational services	50	75	---	100	100
basic care	50	75	---	100	100
medical services	50	75	---	38	80
family services	50	50	---	88	100
diagnosis/referral services	50	75	---	88	100
administrative services	50	75	---	75	100
support programs	100	75	---	100	80%

Table A-14a

Evaluation of Provider Services

	Total	Service Type			Size				Client Type					Control	
		Day	Res.	Mix	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
% of providers formally evaluated during last five years	63%	60	61	74	46	55	70	100	47	52	42	75	74	64	62
% of providers evaluated which use evaluation results to: -- measure clients progress	53	55	46	61	39	58	68	30	69	59	33	63	38	50	56
-- develop instructional programs	82	84	79	81	78	86	82	76	64	93	100	83	80	76	87
-- evaluate program components	40	43	43	28	41	34	48	33	43	53	42	36	32	35	44%

Table A-14b

Evaluation of Provider Services

	MR	ED	DB	MH	MIX
DAY					
% of providers formally evaluated during last five years	60%	50	67	60	67
% of providers which use evaluation results to:					
measure clients' progress	70	50	0	65	50
develop instructional programs	73	100	100	85	79
evaluate program components	30	63	17	40	50
RESIDENTIAL					
% of providers formally evaluated during last five years	0	67	25	83	79
% of providers which use evaluation results to:					
measure clients' progress	75	48	67	50	31
develop instructional programs	50	83	100	83	80
evaluate program components	63	52	67	33	29
MIXED					
% of providers formally evaluated during last five years	100	25	--	88	80
% of providers which use evaluation results to:					
measure clients' progress	50	100	--	65	27
develop instructional programs	50	100	--	81	79
evaluate program components	67	38	--	31	0%

Table A-15a

Formal Client Assessment

	Total	Service Type			Size				Client Type					Control	
		Day	Res.	Mix	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
% of providers which formally assess clients	94%	96	89	96	93	94	94	92	94	97	71	95	95	91	96
% of providers which use same assessment procedures for all clients	48	44	47	57	50	50	40	55	43	43	70	51	48	49	47
% of providers which assess self-sufficiency	94	96	94	89	100	98	85	92	100	81	100	97	96	91	97
% of providers which assess intelligence	83	84	82	84	80	80	81	98	78	78	67	86	89	90	76%

Table A-15b

Formal Client Assessment

	MR	ED	DB	MH	MIX
DAY					
% of providers which formally assess clients	100%	94	100	100	91
% of providers which use same assessment procedures for all clients	55	38	25	36	50
% of providers which assess self-sufficiency	100	88	100	100	96
% of providers which assess intelligence	77	74	90	89	91
RESIDENTIAL					
% of providers which formally assess clients	80	100	50	80	100
% of providers which use same assessment procedures for all clients	25	44	100	50	42
% of providers which assess self-sufficiency	100	76	100	100	99
% of providers which assess intelligence	85	67	100	91	83
MIXED					
% of providers which formally assess clients	100	100	---	97	90
% of providers which use same assessment procedures for all clients	17	50	---	69	60
% of providers which assess self-sufficiency	100	75	---	92	90
% of providers which assess intelligence	100	100	---	73	85%

Table A-16a

Staff Characteristics

	Total	Service Type			Size				Client Type					Control	
		Day	Res.	Mix	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
Race															
-- % White	80 %	85	75	77	88	85	76	59	74	91	71	79	78	74	85
-- % Non-White	20	15	25	23	12	15	24	41	26	9	29	21	22	26	15
Sex															
-- % Male	23	16	29	26	24	18	22	33	17	38	18	11	26	23	23
-- % Female	77	84	71	74	76	82	78	67	83	62	82	89	74	77	77%

Table A-16b

Staff Characteristics

	MR	ED	DB	MH	MIX
DAY					
Race: % white	75%	99	92	83	84
% nonwhite	25	1	8	17	16
Sex: % male	7	30	16	7	22
% female	93	70	84	93	78
RESIDENTIAL					
Race: % white	76	89	55	79	70
% nonwhite	24	11	45	21	30
Sex: % male	28	44	19	6	32
% female	72	56	81	94	68
MIXED					
Race: % white	66	78	--	73	88
% nonwhite	34	22	--	27	12
Sex: % male	26	42	--	20	17
% female	74	58	--	80	83%

Table A-17a

Overtime

	Total	Service Type			Size				Client Type					Control	
		Day	Res	Mix	<10	10-50	51-100	>200	MR	ED	DS	MH	MIX	Public	Private
Per capita overtime hours	0.60	0.85	0.51	0.19	0.99	0.79	0.25	0.17	0.78	0.90	1.05	0.23	0.42	0.63	0.56
Staff category with most overtime:	(n=100)	(n=63)	(n=38)	(n=19)	(n=36)	(n=33)	(n=30)	(n=13)	(n=17)	(n=21)	(n=7)	(n=26)	(n=31)	(n=47)	(n=53)
— administrator	28	11(25%)	11(29%)	6(32%)	4(17%)	11(33%)	7(23%)	6(46%)	4(23%)	10(48%)	0(0%)	5(21%)	9(29%)	12(25%)	16(30%)
— psychologist	10	4(9%)	5(13%)	1(5%)	3(12%)	3(9%)	2(7%)	2(15%)	0(0%)	1(5%)	1(14%)	1(4%)	7(22%)	4(8%)	6(11%)
— social worker	7	3(7%)	4(10%)	0(0%)	1(4%)	2(6%)	3(10%)	1(8%)	2(12%)	1(5%)	0(0%)	1(4%)	3(10%)	4(8%)	3(6%)
— teacher	33	17(39%)	10(26%)	6(32%)	8(33%)	11(33%)	13(43%)	1(8%)	5(29%)	6(28%)	5(71%)	10(42%)	7(22%)	17(36%)	16(30%)
— aide	7	5(12%)	1(3%)	1(5%)	4(17%)	2(6%)	1(3%)	0(0%)	3(18%)	0(0%)	1(14%)	2(8%)	1(3%)	2(4%)	5(9%)
— other	15	3(7%)	7(18%)	5(26%)	4(17%)	4(12%)	4(13%)	3(23%)	3(18%)	3(14%)	0(0%)	5(21%)	4(13%)	8(17%)	7(13%)

Table A-17b

Overtime

	MR	ED	DB	MH	MIX
DAY (n = 43)					
Per capita overtime hours	0.95	1.11	2.02	0.30	0.77
Staff category with most overtime:					
administrator	1(2%)	4(9%)	0	2(5%)	4(9%)
psychologist	0	1(2%)	0	1(2%)	2(5%)
social worker	2(5%)	1(2%)	0	0	0
teacher	3(7%)	2(5%)	2(5%)	5(12%)	5(12%)
aide	2(5%)	0	1(2%)	1(2%)	1(2%)
other	2(5%)	0	0	1(2%)	0
RESIDENTIAL (n = 38)					
Per capita overtime hours	0.72	1.15	0.32	0.17	0.22
Staff category with most overtime:					
administrator	1(3%)	4(10%)	0	2(5%)	4(10%)
psychologist	0	0	1(3%)	0	4(10%)
social worker	0	0	0	1(3%)	3(8%)
teacher	2(5%)	3(8%)	3(8%)	1(3%)	1(3%)
aide	1(3%)	0	0	0	0
other	1(3%)	2(5%)	0	2(5%)	2(5%)
MIXED (n = 19)					
Per capita overtime hours	0.08	0.33	--	0.20	0.10
Staff category with most overtime:					
administrator	2(10%)	2(10%)	--	1(5%)	1(5%)
psychologist	0	0	--	0	1(5%)
social worker	0	0	--	0	0
teacher	0	1(5%)	--	4(2%)	1(5%)
aide	0	0	--	1(5%)	0
other	0	1(5%)	--	2(10%)	2(10%)

Table A-18a

Parent Involvement

	Total	Service Type			Size				Client Type					Control	
		Day	Res.	Mix	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
% of providers in which there is some parent involvement	95%	98	89	100	88	97	100	100	94	100	86	96	97	98	92
% parents active in planning/delivery of services	46	56	35	46	44	60	42	25	47	61	46	45	37	43	49%

Table A-18b

Parent Involvement

	MR	ED	DB	MH	MIX
DAY					
% of providers in which there is some parent involvement	100%	100	67	100	100
% parents active in planning/ delivery of services	45	74	49	58	52
RESIDENTIAL					
% of providers in which there is some parent involvement	75	100	100	83	85
% parents active in planning/ delivery of services	38	47	44	16	30
MIXED					
% of providers in which there is some parent involvement	100	100	--	100	100
% parents active in planning/ delivery of services	77	67	--	45	20%

Table A-19a

Parent and Client Visits

	Total	Service Type		Size				Client Type					Control	
		Res.	Mix	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
% of clients visited by family:														
-- more than once a month	43%	42	45	44	47	53	28	53	58	54	31	36	44	41
-- less than once a month	33	34	29	33	33	33	32	29	34	43	33	31	29	37
-- never	24	24	26	23	21	14	40	18	9	3	36	33	27	22
% of clients who make home visits:														
-- more than once a month	40	29	60	22	54	53	20	45	55	48	38	29	46	32
-- less than once a month	34	38	25	53	22	37	33	45	41	37	27	31	29	40
-- never	27	33	16	25	24	13	47	8	8	15	35	40	26	28%

Table A-19b

Parent and Client Visits (Residential Providers)

	MR	ED	DB	MH	MIX
RESIDENTIAL					
% of clients visited by family:					
more than once a month	52%	49	54	24	40
less than once a month	24	46	43	26	32
never	25	16	4	50	28
% of clients who make home visits:					
more than once a month	32	42	48	14	23
less than once a month	53	50	37	14	37
never	9	9	15	71	40
MIXED					
% of clients visited by family:					
more than once a month	55	82	--	37	18
less than once a month	40	2	--	38	27
never	5	17	--	25	55
% of clients who make home visits:					
more than once a month	63	80	--	56	48
less than once a month	28	19	--	37	13
never	10	5	--	7	39%

Table A-20a

Changes in Providers

	Total	Service Type			Size				Client Type					Control	
		DAY	RES	MIX	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
% of providers which changed over last 5 years in:															
- enrollment capacity	56%	55	53	63	41	46	72	69	50	60	57	54	57	56	56
- enrollment size	75	78	65	90	68	73	86	69	75	68	71	71	83	78	73
- handicaps served	42	40	42	47	32	39	48	54	31	45	43	38	50	42	42
- severity of handicaps served	46	36	49	63	29	46	54	62	31	39	43	50	57	50	43
- discharge criteria	27	18	29	42	14	27	21	62	25	25	14	33	28	33	22
- funding source/ level	74	80	73	63	68	67	96	54	75	63	71	75	80	67	80
- physical size of facility	58	58	55	63	41	55	72	62	69	75	71	46	47	58	58
- range of services	71	75	60	84	46	67	90	85	75	65	71	79	67	73	69
- number of staff	79	75	81	84	71	76	90	77	80	80	100	83	70	45	51
- educational approach	75	68	82	79	77	70	76	85	94	70	71	71	73	73	77%

Table A-20b

Changes in Providers

	MR	ED	DB	MH	MIX
DAY % of providers which changed over last 5 years in:					
enrollment capacity	67%	57	67	50	46
enrollment size	89	71	67	70	82
handicaps served	33	57	33	30	46
severity of handicaps served	44	17	0	40	46
discharge criteria	22	29	0	20	10
funding source/level	67	86	67	70	100
physical size of facility	78	57	67	40	55
range of services	90	86	33	70	73
number of staff	78	71	100	80	64
educational approach	89	57	33	50	82
RESIDENTIAL % of providers which changed over last 5 years in:					
enrollment capacity	20	56	50	50	64
enrollment size	60	50	75	33	86
handicaps served	20	44	50	17	57
severity of handicaps served	0	50	75	33	64
discharge criteria	20	22	25	50	29
funding source/level	100	50	75	83	71
physical size of facility	40	78	75	50	43
range of services	40	44	100	67	64
number of staff	75	89	100	83	71
educational approach	100	89	100	83	64
MIXED % of providers which changed over last 5 years in:					
enrollment capacity	50	75	--	63	60
enrollment size	50	100	--	100	80
handicaps served	50	25	--	63	40
severity of handicaps served	50	50	--	75	60
discharge criteria	50	25	--	38	60
funding source/level	50	50	--	75	60
physical size of facility	100	100	--	50	40
range of services	100	75	--	100	60
number of staff	100	75	--	88	80
educational approach	100	50	--	88	80%

Table A-21a

Provider Quality

	Total	Service Type			Size				Client Type					Control	
		DAY	RES	MIX	<10	10-50	51-200	>200	MR	ED	DB	MH	MIX	Public	Private
Total quality as % of maximum score	63%	65%	59%	67%	57%	63%	68%	64%	62%	66%	62%	62%	63%	63%	64%
Quality components:															
- educational opportunities	8.4	8.7	7.7	8.8	8.4	8.5	8.5	7.5	8.1	8.6	8.7	8.3	8.3	8.3	8.4
- staff-client interaction	0.2	0.3	0.1	0.1	0.3	0.2	0.2	0.0	0.4	0.1	0.7	0.2	0.1	0.3	0.2
- parent involvement	5.1	5.5	4.7	5.3	4.3	5.2	5.7	5.4	5.3	5.0	5.1	5.3	5.0	5.1	5.1
- humanization	3.6	3.7	3.3	3.7	3.9	3.3	3.7	3.3	3.5	3.9	3.8	3.3	3.6	3.5	3.7
- extent of training and evaluation	4.3	4.4	4.2	4.6	3.8	4.2	4.6	5.1	3.9	4.2	4.9	4.2	4.6	4.5	4.2
- client movement out of provider	3.3	3.1	3.1	3.8	2.2	3.2	3.9	3.8	3.1	3.8	1.4	3.2	3.5	3.1	3.4

Table A-21b

Provider Quality

	MR	ED	DB	MH	MIX
DAY					
Total quality as % of maximum score	67%	67%	57%	65%	65%
Quality components:					
educational opportunities	9.0	8.8	7.3	8.7	8.9
staff-client interaction	0.6	0.1	0.3	0.4	0.2
parent involvement	6.0	5.3	4.7	5.8	5.2
humanization	3.8	3.9	4.0	3.8	3.5
extent of training and evaluation	4.3	4.3	5.0	4.0	4.7
client movement out of provider.	3.1	3.5	1.3	3.1	3.4
RESIDENTIAL					
Total quality as % of maximum score	46%	64%	66%	53%	61%
Quality components:					
educational opportunities	6.4	8.6	9.8	5.7	7.8
staff-client interaction	0	0.1	1.0	0	0
parent involvement	3.2	4.9	5.5	4.7	4.9
humanization	2.9	3.9	3.6	1.8	3.7
extent of training and evaluation	2.8	4.2	4.8	4.2	4.4
client movement out of provider	2.4	3.6	1.5	3.3	3.4
MIXED					
Total quality as % of maximum score	75%	67%	--	66%	64%
Quality components:					
educational opportunities	7.5	8.5	--	9.8	8.2
staff-client interaction	0	0	--	0.1	0
parent involvement	7.0	4.5	--	5.3	5.2
humanization	3.9	3.9	--	3.7	3.5
extent of training and evaluation	5.0	4.0	--	4.5	5.0
client movement out of provider	5.0	4.8	--	3.1	3.8

APPENDIX B

TABLES OF OBSERVATION DATA

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Table B-1

Percent of Observations by Provider Service Type
by Estimated Percent Severely Handicapped in Setting

Percent Severely Handicapped	Provider Service Type			
	Total	Day	Residential	Mixed
No Estimate	4.3%	4.9	1.8	5.3
0-20%	10.5	12.0	10.6	8.9
21-40%	6.4	6.0	5.3	7.7
41-60%	5.2	6.0	2.8	5.8
61-80%	4.7	4.4	0.7	7.7
81-99%	6.8	8.9	3.9	6.5
100%	62.1	57.9	74.8	58.3
	100	100	100	100%

Table B-2

Percent of Observations by Provider Service Type
in Various Settings Within the Provider

Setting	Provider Service Type			
	Total	Day	Residential	Mixed
Ward	4.1%	0.0	11.3	3.6
Living room or Day room	9.5	3.5	16.3	11.0
Workshop	4.4	4.0	2.8	6.0
Dining room or Cafeteria	6.6	3.8	7.8	8.9
Bedroom or bathroom	3.3	1.6	6.4	3.1
Classroom	54.1	70.7	31.9	51.1
Auditorium, Gym or Recreation area	6.8	8.0	7.4	5.0
Therapy room	4.1	3.1	6.0	3.8
Other	7.1	5.8	10.0	7.4
	100	100	100	100%

Table B-3

Percent of Observations by Provider Service Type
by Number of Clients in Beds and/or Cribs

No. of Clients in Beds/Cribs	Provider Service Type			
	Total	Day	Residential	Mixed
0	93.1%	96.2	85.5	95.2
1-10	5.9	3.1	12.0	4.8
11-20	1.0	0.7	2.5	0.0
	0.1	0.0	0.0	0.0
	100	100	100	100%

Table B-4

Percent of Observations by Provider Service Type
by Number of Clients Out of Beds

No. of Clients Out of Beds	Provider Service Type			
	Total	Day	Residential	Mixed
0	2.7%	1.6	6.7	1.0
1-10	80.0	84.2	76.3	78.1
11-20	11.6	7.8	12.4	15.9
21-30	3.0	4.0	1.8	2.1
31-40	1.6	1.1	2.1	1.7
41-50	0.6	0.6	0.7	0.5
51-60	0.2	0.3	0.0	0.5
61-70	0.2	0.0	0.0	0.2
over 70	0.1	0.4	0.0	0.0
	100	100	100	100%

Table B-5

Percent of Observations by Provider Service Type
by Number of Staff Present

Number of Staff Present	Provider Service Type			
	Total	Day	Residential	Mixed
0	2.6%	1.1	5.0	2.6
1-5	90.4	88.7	91.1	92.1
6-10	5.5	8.2	2.8	4.1
11-15	0.8	0.9	1.1	0.5
16-20	0.4	0.2	0.0	0.7
21-25	0.0	0.2	0.0	0.0
26-30	0.0	0.0	0.0	0.0
31-35	0.2	0.5	0.0	0.0
over 35	0.1	0.2	0.0	0.0
	100	100	100	100%

Table B-6

Percent of Observations by Provider Service Type
by Sex of Group

Sex of Group	Provider Service Type			
	Total	Day	Residential	Mixed
All Male	22.8 %	19.1	26.3	24.4
All Female	8.0	3.8	8.2	12.6
Mixed	69.2	77.1	65.5	63.0
	100	100	100	100%

Table B-7

Percent of Observations by Provider Service Type
by Degree of Institutionalization

Degree of Institutionalization	Provider Service Type			
	Total	Day	Residential	Mixed
Low	45.4%	56.0	37.8	38.1
Moderate	42.4	35.5	44.2	48.0
High	12.2	8.5	18.0	12.2
	100	100	100	100%

Table B-8

Percent of Observations by Provider Service Type
by Condition of Interior of Building

Condition of Building Interior	Provider Service Type			
	Total	Day	Residential	Mixed
Excellent	77.4%	79.2	73.8	78.0
Moderate	21.4	20.5	25.1	20.0
Poor	1.2	0.3	1.1	2.9
	100	100	100	100%

Table B-9

Percent of Observations by Provider Service Type
by Personal Appearance of Clients

Personal Appearance of Clients	Provider Service Type			
	Total	Day	Residential	Mixed
1. Adequately Clothed	96.1%	99.8	91.8	95.2
2. Ill-fitting Clothes	2.0	0.2	2.8	3.1
3. Inappropriately Clothed	0.9	0.0	3.2	0.2
4. Partly Clothed or Completely Denuded	0.5	0.0	0.7	1.0
5. 1 and 3 above	0.3	0.0	1.1	0.2
6. 1 and 4 above	0.2	0.0	0.4	0.2
	100	100	100	100%

Table B-10

Percent of Observations by Provider Service Type
by Odor of the Setting

Odor of Setting	Provider Service Type			
	Total	Day	Residential	Mixed
Neutral	93.6%	97.5	86.2	94.2
Antiseptic	2.6	0.0	9.4	0.7
Noxious	3.8	2.5	4.4	5.2
	100	100	100	100%

Table B-11

Percent of Observations by Provider Service Type
by Degree of Sleeping Privacy

Degree of Sleeping Privacy	Provider Service Type			
	Total	Day	Residential	Mixed
Very Private	20.2%	59.4	9.8	22.2
Somewhat Private	41.1	9.4	53.4	35.7
Not Private	38.7	31.3	36.8	42.1
	100	100	100	100%

Table B-12

Percent of Observations by Provider Service Type
by Degree of Toileting Privacy

Degree of Toileting Privacy	Provider Service Type			
	Total	Day	Residential	Mixed
Very Private	61.9%	79.1	45.5	53.5
Somewhat Private	15.9	12.4	13.1	21.2
Not Private	22.2	18.5	41.4	25.3
	100	100	100	100%

Table B-13

Percent of Observations by Provider Service Type
by General Activity Level

General Activity Level	Provider Service Type			
	Total	Day	Residential	Mixed
Low	24.3%	17.8	31.4	26.6
Moderate	49.3	49.3	53.2	46.6
High	26.4	32.9	15.4	26.8
	100	100	100	100%

Table B-14

Percent of Observations by Provider Service Type
by Type of Activity

Type of Activity	Provider Service Type			
	Total	Day	Residential	Mixed
No Activity	11.3%	2.9	21.6	13.4
Meal	12.9	11.8	16.0	12.0
Nap or Resting	3.6	5.1	4.3	1.4
Vocational	3.2	2.9	2.8	3.8
Recreational	16.3	16.9	13.1	18.0
Educational	33.6	38.8	23.0	35.3
Self Care	3.2	2.2	3.5	4.1
Basic Care	1.0	0.9	0.4	1.4
Free Play	10.9	14.0	9.6	8.6
Therapy	3.9	4.7	5.7	1.9
	100	100	100	100%

Table B-15

Percent of Observations by Provider Service Type
by Presence of Operant Conditioning

Presence of Operant Conditioning	Provider Service Type			
	Total	Day	Residential	Mixed
Observed	21.6%	28.6	17.9	16.7
Not Observed	78.4	71.4	82.1	83.2
	100	100	100	100%

Table B-16

Percent of Observations by Provider Service Type
by Presence of Play Materials

Presence of Play Materials	Provider Service Type			
	Total	Day	Residential	Mixed
None	8.6%	4.1	13.8	9.8
Few	17.5	12.6	25.7	17.2
Adequate	73.9	83.2	60.5	73.0
	100	100	100	100%

Table B-17

Percent of Observations by Provider Service Type
by Condition of Materials

Condition of Materials	Provider Service Type			
	Total	Day	Residential	Mixed
Excellent	61.0%	68.7	51.3	59.2
Good	24.6	23.3	28.0	23.8
Fair	4.8	3.7	6.5	4.9
Poor	1.0	0.0	1.8	1.5
Not Applicable	8.6	4.3	12.4	10.6
	100	100	100	100%

Table B-18

Percent of Observations by Provider Service Type
by Quality of Materials

Quality of Materials	Provider Service Type			
	Total	Day	Residential	Mixed
High	62.9%	70.3	53.1	61.9
Moderate	22.4	23.8	22.2	27.1
Low	6.0	1.4	12.4	6.4
Not Applicable	8.7	4.6	12.4	10.6
	100	100	100	100%

APPENDIX C

AVERAGE STANDARDIZED COST PER CHILDWEEK
(DOLLAR TABLES)

Table C-1

AVERAGE STANDARDIZED COST PER CHILDWEEK
BY SERVICE AREA AND STAFF CATEGORY
FOR 95 PROVIDERS

Service Area	Staff Category												TOTAL
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Basic care	0.43	0.01	0.42	0.03	0.02	1.30	1.85	11.85	4.52	2.33	0.06	1.50	24.32
Educational/ Habilitative	0.52	0.02	2.15	0.97	0.44	7.62	0.47	5.76	27.37	6.89	0.42	2.76	55.39
Medical services	0.04	0.41	0.13	0	0.02	0.35	1.50	0.10	0.02	0.08	0	0.04	2.69
Family/Community Services	0.31	0.01	0.23	0.17	1.31	0.42	0.12	0.42	0.69	0.16	0.02	0.67	4.53
Diagnosis and Referral	0.38	0.03	0.30	20.4	0.43	1.62	0.08	0.25	1.60	0.24	0.01	0.22	6.60
Administration	17.98	0.02	0.43	0.20	0.34	1.06	0.36	0.32	1.35	0.30	0	0.74	23.10
Support	0.51	0.01	0.35	0.01	0.01	0.23	0.20	1.76	0.13	0.13	15.19	0.12	18.65
TOTAL	20.17	0.51	4.01	3.42	2.57	12.00	4.58	20.46	35.68	10.13	15.70	6.05	135.28

Table C-2

AVERAGE STANDARDIZED COST PER CHILDWEEK
BY SERVICE AREA AND STAFF CATEGORY
FOR DAY PROVIDERS

Service Area	Staff Category												TOTAL
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Basic care	0.16	0	0	0	0	0.18	0.12	0.22	6.20	2.38	0.02	0.01	9.29
Educational/ Habilitative	0.76	0	0	0.55	0.32	5.85	0.02	0.14	25.59	7.66	0	0.35	41.24
Medical services	0.01	0.06	0	0	0.02	0.24	0.19	0	0.02	0.17	0	0	0.71
Family/Community Services	0.37	0	0	0.24	1.40	0.47	0.10	0	1.12	0.29	0	0.31	4.30
Diagnosis and Referral	0.41	0	0.14	0.39	0.37	0.62	0.02	0	0.59	0.25	0	0.15	2.94
Administration	14.36	0.04	0.02	0.10	0.37	0.97	0.01	0	1.56	0.60	0	0.04	18.07
Support	0.04	0	0	0.01	0	0.06	0	0.01	0.19	0.24	2.36	0	2.91
TOTAL	16.11	0.10	0.16	1.29	2.48	8.39	0.46	0.37	35.27	11.59	2.38	0.86	79.46

Table C-3

AVERAGE STANDARDIZED COST PER CHILDWEEK
BY SERVICE AREA AND STAFF CATEGORY
FOR PROVIDERS PRIMARILY SERVING
EMOTIONALLY DISTURBED CLIENTS

Service Area	Staff Category												TOTAL
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Basic care	0.20	0	2.10	0	0.12	5.63	0.66	5.29	0.91	1.18	0.08	2.75	30.92
Educational/ Habilitative	1.38	0	10.26	0.98	1.56	16.35	0.17	4.32	16.01	9.56	0.63	6.42	67.64
Medical services	0.01	0.04	0.36	0	0.01	0.40	0.55	0.06	0.01	0	0	0.04	1.49
Family/Community Services	0.63	0	1.00	0.13	2.33	1.67	0.12	0.17	0.58	0.11	0	0.61	7.35
Diagnosis and Referral	1.10	0	1.27	0.42	0.98	2.30	0.12	0.30	0.71	0.04	0	0.37	7.61
Administration	31.24	0	2.12	0.09	1.05	4.50	0.41	0.31	2.05	0.39	0	0.27	42.44
Support	0.06	0	1.75	0.03	0.02	0.89	0.03	0.47	0.15	0.06	[illegible]	0.38	21.20
TOTAL	34.62	0.04	18.86	1.65	6.07	31.74	2.06	10.93	20.42	13.34	18.10	10.81	168.64

Table C-4

AVERAGE STANDARDIZED COST PER CHILDWEEK
BY SERVICE AREA AND STAFF CATEGORY
FOR PROVIDERS PRIMARILY SERVING OTHER THAN
EMOTIONALLY DISTURBED CLIENTS

Service Area	Staff Category												TOTAL
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Basic care	1.74	0.01	0	0.04	0	0.22	3.15	13.49	5.43	2.12	0.05	1.19	26.44
Educational/ Habilitative	0.31	0.02	0.12	0.97	0.16	5.43	0.34	6.12	30.21	6.22	0.37	1.84	52.31
Medical services	0.04	0.50	0.07	0	0.02	0.34	1.74	0.11	0.03	0.11	0	0.04	3.00
Family/Community Services	0.23	0.01	0.04	0.18	1.06	0.11	0.12	0.48	0.71	0.17	0.02	0.69	3.82
Diagnosis and Referral	0.20	0.04	0.06	2.45	0.29	0.70	0.07	0.23	1.82	0.29	0.01	0.18	6.34
Administration	14.59	0.03	0.01	0.23	0.16	0.20	0.34	0.32	1.18	0.28	0	0.86	18.20
Support	0.63	0.01	0	0	0.01	0.06	0.24	2.08	0.12	0.14	14.62	0.06	17.97
TOTAL	17.74	0.62	0.30	3.87	1.70	7.06	5.20	22.83	39.50	9.33	15.07	4.86	128.08

Table C-5

AVERAGE STANDARDIZED COST PER CHILDWEEK
BY SERVICE AREA AND STAFF CATEGORY
FOR MIXED PROVIDERS

Service Area	Staff Category												TOTAL
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Basic care	0.10	0.02	0	0.03	0	3.56	0.71	16.57	1.30	0.80	0	2.99	26.08
Educational/ Habilitative	0.43	0	0.02	0.47	0.54	3.77	0.25	8.62	19.71	5.78	0	6.51	46.10
Medical services	0.02	0.17	0	0	0	0.39	0.83	0.13	0.08	0.03	0	0.11	1.76
Family/Community Services	0.36	0.01	0.05	0.02	1.01	0.46	0.05	0.78	0.81	0.07	0	0.26	3.88
Diagnosis and Referral	0.23	0.01	0.06	0.20	0.68	0.86	0.11	0.31	0.68	0.07	0	0.22	3.52
Administration	26.01	0.01	0	0.31	0.32	1.45	0.38	0.41	1.88	0.04	0	0.13	30.94
Support	0.02	0	0	0.01	0	0.22	0.09	1.75	0.13	0.01	25.07	0.12	27.42
TOTAL	27.17	0.22	0.13	1.13	2.55	10.71	2.42	28.57	24.59	6.80	25.07	10.34	139.70

Table C-6

AVERAGE STANDARDIZED COST PER CHILDWEEK
BY SERVICE AREA AND STAFF CATEGORY
FOR RESIDENTIAL PROVIDERS

Service Area	Staff Category												TOTAL
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Basic care	3.64	0.02	1.14	0.08	0.06	1.59	4.54	23.83	4.03	3.03	0.13	2.61	44.70
Educational/ Habilitative	0.28	0.05	5.83	1.74	0.53	11.66	1.12	11.27	33.27	6.47	1.13	3.89	77.24
Medical services	0.08	0.95	0.35	0	0.02	0.47	3.43	0.21	0	0	0	0.05	5.56
Family/Community Services	0.22	0.02	0.60	0.15	1.35	0.35	0.18	0.75	0.10	0.04	0.04	1.32	5.12
Diagnosis and Referral	0.41	0.07	0.61	4.94	0.37	1.59	0.13	0.52	3.28	0.32	0.02	0.31	12.57
Administration	17.98	0.01	1.15	0.27	0.32	0.98	0.77	0.67	0.84	0.06	0	1.89	24.94
Support	1.34	0.02	0.95	0.01	0.02	0.45	0.50	3.90	0.05	0.04	24.63	0.26	32.17
TOTAL	23.95	1.14	10.63	7.19	2.67	17.09	10.67	41.15	41.57	9.96	25.95	10.33	202.30

Table D-1

AVERAGE STANDARDIZED COSTS PER CHILDWEEK:
PERCENT ALLOCATION OF STAFF CATEGORY COSTS TO SERVICE AREAS
FOR 95 PROVIDERS

Service Area	Staff Category												TOTAL
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Basic care	6.8	1.8	10.5	1.0	0.9	10.9	40.6	57.9	12.7	21.0	0.4	24.8	19.6
Educational/ Habilitative	2.5	3.8	53.6	28.4	17.0	63.4	10.2	28.2	76.7	68.0	2.7	45.6	40.6
Medical services	0.2	81.9	3.2	0.0	0.7	2.9	32.8	0.5	0.1	0.8	0.0	0.6	2.0
Family/Community Services	1.5	1.6	5.8	4.9	51.1	3.5	2.6	2.0	1.9	1.5	0.1	11.1	3.5
Diagnosis and Referral	1.8	5.6	7.4	59.6	16.7	8.5	1.7	1.2	4.5	2.4	0.0	3.6	4.8
Administration	84.9	4.0	10.8	5.9	13.3	8.8	7.8	1.6	3.8	3.0	0.0	12.2	16.7
Support	2.4	1.3	8.7	0.[illegible]	0.4	1.9	4.4	8.6	0.4	1.2	96.8	2.0	13.7
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table D-2

AVERAGE STANDARDIZED COSTS PER CHILDHOUR:
PERCENT ALLOCATION OF STAFF CATEGORY COSTS
TO SERVICE AREAS FOR DAY PROVIDERS

Service Area	Staff Category												TOTAL
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Basic care	1.0	0	0	0	0	2.1	26.1	59.5	17.4	30.5	6.0	1.2	11.7
Educational/ Habilitative	4.7	0	0	42.6	12.9	69.7	6.3	37.8	72.6	66.1	0	60.7	51.9
Medical services	0.1	60.0	0	0	0.8	2.9	41.3	0	0.1	1.9	0	0	0.9
Family/Community Services	2.3	0	0	18.6	56.5	5.6	21.7	0	3.2	2.5	0	36.0	5.4
Diagnosis and Referral	2.5	0	87.5	30.2	14.9	7.4	4.3	0	1.7	2.3	0	17.4	3.7
Administration	89.1	40.0	12.5	7.8	14.9	11.6	2.2	0	4.4	5.2	0	4.7	22.7
Support	0.2	0	0	0.8	0	0.7	0	2.7	0.5	2.1	99.2	0	3.7
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table D-3

AVERAGE PERCENT ALLOCATION
OF STAFF CATEGORY COSTS TO SERVICE AREAS
FOR MIXED PROVIDERS

Service Area	Staff Category												TOTAL
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Basic care	0.4	9.1	0	2.7	0	33.2	29.3	58.0	5.3	11.8	0	28.9	18.7
Educational/ Habilitative	1.6	0	15.4	41.6	21.2	35.2	10.3	30.2	80.2	85.0	0	63.0	33.0
Medical services	0.1	77.3	0	0	0	3.6	34.3	0.5	0.3	0.4	0	1.1	1.3
Family/Community Services	1.3	4.5	38.5	1.8	39.6	4.3	2.1	2.7	3.3	1.0	0	2.5	2.8
Diagnosis and Referral	0.8	4.5	46.2	25.7	26.7	8.0	4.5	1.1	2.8	1.0	0	2.1	2.5
Administration	95.7	4.5	0	27.4	12.5	13.5	15.7	1.4	7.6	0.6	0	1.3	22.1
Support	0.1	0	0	0.9	0	2.1	3.7	6.1	0.5	0.1	100.0	1.2	19.6
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table D-4

AVERAGE STANDARDIZED COSTS PER CHILDWEEK: PERCENT ALLOCATION OF STAFF CATEGORY COSTS TO SERVICE AREAS FOR RESIDENTIAL PROVIDERS

Service Area	Staff Category												TOTAL
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Basic care	15.2	1.8	10.7	1.1	2.2	9.3	42.5	57.9	9.7	30.4	0.5	23.3	22.1
Educational/ Habilitative	1.2	4.4	50.8	24.2	19.9	68.2	10.5	37.4	80.0	65.0	4.4	37.7	38.2
Medical services	0.3	83.3	3.3	0	0.7	2.8	32.1	0.5	0	0	0	0.5	2.7
Family/Community Services	0.9	1.8	5.6	2.1	50.6	2.0	1.7	1.8	0.2	0.4	0.2	12.8	3.5
Diagnosis and Referral	1.7	6.1	5.7	68.7	13.9	9.3	1.2	1.3	7.9	3.2	0.1	3.0	6.2
Administration	75.1	0.9	10.8	3.8	12.0	5.7	7.2	1.6	2.0	0.6	0	18.3	12.3
Support	5.6	1.8	8.9	0.1	0.7	2.6	4.7	9.5	0.1	0.4	94.9	2.5	15.9
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table D-5

AVERAGE STANDARDIZED COSTS PER CHILDWEEK:
PERCENT ALLOCATION OF STAFF CATEGORY TO SERVICE AREAS
FOR PROVIDERS PRIMARILY SERVING EMOTIONALLY DISTURBED CLIENTS

Service Area	Staff Category												TOTAL
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Basic care	0.6	0	11.2	0	2.0	17.7	32.0	48.4	4.5	23.8	0.4	25.4	12.4
Educational/ Habilitative	4.0	0	54.4	59.3	25.7	51.5	8.3	39.5	70.4	71.8	3.5	39.4	40.1
Medical services	0.0	100	1.9	0	0.2	1.3	26.7	0.5	0.0	0	0	0.4	0.9
Family/Community Services	1.8	0	5.3	7.9	38.4	5.3	5.8	1.6	2.8	0.8	0	5.7	4.4
Diagnosis and Referral	3.2	0	6.7	25.5	16.1	7.2	5.8	2.7	3.5	0.3	0	3.4	4.5
Administration	90.2	0	11.2	5.5	17.3	14.2	19.9	2.9	10.0	2.9	0	2.5	25.2
Support	0.2	0	9.3	1.8	0.3	2.8	1.5	4.4	0.8	0.4	96.1	3.2	12.6
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table D-6

AVERAGE STANDARDIZED COSTS PER CHILDWEEK:
PERCENT ALLOCATION OF STAFF CATEGORY TO SERVICE AREAS
FOR PROVIDERS PRIMARILY SERVING OTHER THAN EMOTIONALLY DISTURBED CLIENTS

Service Area	Staff Category												TOTAL
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Basic care	9.8	1.6	0	1.0	0	0.4	41.3	59.1	13.7	22.7	0.4	24.5	14.0
Educational/ Habilitative	1.7	3.2	40.0	25.1	9.4	97.1	10.4	26.8	76.5	66.7	2.5	37.9	57.2
Medical services	0.2	80.7	23.4	0	1.2	0.6	33.5	0.5	0.1	1.2	0	0.8	1.7
Family/Community Services	1.3	1.6	13.3	4.7	62.4	0.2	2.3	2.1	1.8	1.8	0.1	14.2	2.2
Diagnosis and Referral	1.1	6.5	20.0	63.3	17.0	1.2	1.3	1.0	4.6	3.1	0.1	3.7	3.6
Administration	82.3	4.8	3.3	5.9	9.4	0.4	6.5	1.4	3.0	3.0	0	17.7	10.3
Support	3.6	1.6	0	0	0.6	0.1	4.7	9.1	0.3	1.5	97.0	1.2	10.2
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

APPENDIX E

AVERAGE STANDARDIZED COSTS PER CHILDWEEK
(ROW PERCENTS)

Table E-1

AVERAGE STREAMLINED COSTS PER CHILDSERVE
PERCENT ALLOCATION OF SERVICE AREA COSTS
TO STAFF CATEGORIES FOR 95 PROVIDERS

Service Area	Staff Category												TOTAL
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Basic care	5.7	0.0	1.7	0.1	0.1	5.1	7.3	46.6	17.9	9.2	0.2	5.9	100.0
Educational/ Habilitative	0.9	0.0	3.9	1.8	0.8	13.8	0.8	10.4	49.4	12.4	0.8	5.0	100.0
Medical services	1.4	15.2	4.7	0.0	0.7	13.1	55.8	3.8	0.9	3.1	0.0	1.2	100.0
Family/Community Services	6.9	0.2	5.1	3.7	29.1	9.4	2.6	9.2	15.2	3.4	0.3	14.9	100.0
Diagnosis and Referral	5.7	0.4	4.5	31.1	6.5	15.5	1.2	3.7	24.3	2.7	0.1	3.3	100.0
Administration	77.8	0.1	1.9	0.9	1.5	4.6	1.5	1.4	5.9	1.3	0.0	3.2	100.0
Support	2.8	0.0	1.9	0.0	0.0	1.2	1.1	9.4	0.7	0.7	81.3	0.6	100.0
TOTAL	15.5	0.4	2.9	2.5	1.9	6.8	3.4	15.0	26.2	7.4	11.5	4.4	100.0

Table E-2

AVERAGE STANDARDIZED COSTS PER CHILDWEEK:
PERCENT ALLOCATION OF SERVICE AREA COSTS
TO STAFF CATEGORIES FOR DAY PROVIDERS

Service Area	Staff Category												TOTAL
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Basic care	1.7	0	0	0	0	1.9	1.3	3.4	46.7	23.6	0.2	0.1	100.0
Educational/ Habilitative	1.8	0	0	1.3	0.8	14.2	0	0.3	62.1	18.6	0	0.8	100.0
Medical services	1.4	8.5	0	0	2.8	33.8	26.8	0	2.8	23.9	0	0	100.0
Family/Community Services	8.6	0	0	5.6	32.8	10.9	2.3	0	26.0	6.7	0	7.2	100.0
Diagnosis and Referral	13.9	0	4.8	13.3	12.6	21.1	0.7	0	20.1	8.5	0	5.1	100.0
Administration	79.5	0.2	0.1	0.6	3.0	5.4	0.1	0	8.6	3.3	0	0.2	100.0
Support	1.4	0	0	0.3	0	2.1	0	0.3	6.5	8.2	81.1	0	100.0
TOTAL	20.3	0.1	0.2	1.6	3.1	10.6	0.6	0.5	44.4	14.6	3.0	1.1	100.0

Table E-2

AVERAGE STANDARDIZED COSTS PER CHILDWEEK:
PERCENT ALLOCATION OF SERVICE AREA COSTS TO STAFF CATEGORIES
FOR MIXED PROVIDERS

Service Area	Staff Category												TOTAL
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	%
Basic care	0.4	0.1	0	0.1	.3	13.7	2.7	61.5	5.0	3.1	0	11.5	100.0
Educational/ Habilitative	0.9	0	0	1.0	1.2	8.2	0.5	18.7	42.8	18.5	0	14.1	100.0
Medical services	1.1	9.7	0	0	0	22.2	47.2	7.4	4.5	1.9	0	6.3	100.0
Family/Community Services	9.3	0.3	1.3	0.5	26.8	11.9	1.3	20.1	20.9	1.8	0	6.7	100.0
Diagnosis and Referral	6.5	0.3	1.7	0.3	19.3	24.4	3.1	8.8	19.3	2.0	0	6.3	100.0
Administration	84.1	0	0	1.0	1.0	4.7	1.2	1.3	6.1	0.1	0	0.4	100.0
Support	0.1	0	0	0	0	0.8	0.3	6.4	0.5	0	91.4	0.4	100.0
TOTAL	19.4	0.2	0.1	0.8	1.9	7.7	1.7	20.3	17.6	4.9	17.9	7.4	100.0

Table E-4

AVERAGE STANDARDIZED COSTS PER CHILDWEEK:
PERCENT ALLOCATION OF STAFF CATEGORY COSTS TO SERVICE AREAS
FOR RESIDENTIAL PROVIDERS

Service Area	Staff Category												TOTAL
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Basic care	8.1	0	2.6	0.2	0.1	3.6	10.2	53.3	9.0	6.8	0.3	5.8	100.0
Educational/ Habilitative	0.4	0.1	7.5	2.3	0.7	15.1	1.5	14.6	43.1	8.4	1.5	5.0	100.0
Medical services	1.4	17.1	6.3	0	0.4	8.5	61.7	3.8	0	0	0	0.9	100.0
Family/Community Services	4.3	0.4	11.7	2.9	26.4	6.8	3.5	14.6	2.0	0.8	0.8	25.8	100.0
Diagnosis and Referral	3.3	0.6	4.9	39.3	2.9	12.6	1.0	4.1	26.1	2.5	0.2	2.5	100.0
Administration	72.1	0	4.6	1.1	1.3	3.9	3.1	2.7	3.4	0.2	0	7.6	100.0
Support	4.2	0.1	3.0	0	0.1	1.4	1.6	12.1	0.2	0.1	76.6	0.8	100.0
TOTAL	11.8	0.6	5.3	3.6	1.3	8.4	5.3	20.3	20.5	4.9	12.8	5.1	100.0

Table E-5

AVERAGE STANDARDIZED COSTS PER CHILDWEEK:
PERCENT ALLOCATION OF SERVICE AREA COSTS TO STAFF CATEGORIES
FOR PROVIDERS PRIMARILY SERVING EMOTIONALLY DISTURBED CLIENTS

Service Area	Staff Category												TOTAL
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Basic care	1.0	0	10.0	0	0.6	26.9	3.2	25.3	4.3	15.2	0.4	13.1	100.0
Educational/ Habilitative	2.0	0	15.2	1.4	2.3	24.2	0.3	6.4	23.7	14.1	0.9	9.5	100.0
Medical services	0.5	2.7	24.3	0	0.7	27.0	37.2	4.1	0.7	0	0	2.8	100.0
Family/Community Services	8.4	0	13.6	1.8	31.7	22.8	1.7	2.3	7.9	1.5	0	8.3	100.0
Diagnosis and Referral	16.4	0	16.7	5.5	12.9	30.2	1.6	3.9	9.3	0.6	0	4.9	100.0
Administration	73.4	0	5.0	0.2	2.6	10.6	1.0	0.9	4.8	0.9	0	0.6	100.0
Support	0.3	0	8.3	0.1	0.1	4.2	0.1	3.2	0.7	0.3	82.0	1.7	100.0
TOTAL	20.5	0.02	11.2	1.0	3.6	18.8	1.2	6.3	12.1	7.9	10.7	6.4	100.0

Table B-6

AVERAGE STANDARDIZED COSTS PER CHILDHOUR,
PERCENT ALLOCATION OF SERVICE AREA COSTS TO STAFF CATEGORIES
FOR PROVIDERS PRIMARILY SERVING OTHER THAN EMOTIONALLY DISTURBED CLIENTS

Service Area	Staff Category												TOTAL
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Teachers	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Basic care	6.6	0.0	0	0.2	0.0	0.0	0.1	51.0	29.5	8.0	0.2	4.6	100.0
Educational/ Habilitative	0.2	0.0	0.1	1.0	0.2	52.7	0.9	6.0	29.8	6.1	0.5	1.9	100.0
Medical services	1.2	16.7	2.3	0	0.7	11.3	36.0	3.7	1.0	3.7	0	1.4	100.0
Family/Community Services	6.0	0.3	1.0	4.7	27.7	3.9	3.1	12.6	18.6	4.9	0.5	12.1	100.0
Diagnosis and Referral	3.2	0.6	0.9	38.6	4.6	11.0	1.1	3.6	28.7	4.6	0.2	2.9	100.0
Administration	80.2	0.2	0.1	1.3	0.9	1.1	1.9	1.8	6.5	1.5	0	4.7	100.0
Support	3.5	0.1	0	0	0.1	0.3	1.2	11.6	0.7	0.8	81.4	0.2	100.0
TOTAL	10.0	0.4	0.2	2.2	1.0	31.6	3.9	12.9	22.3	5.3	8.5	2.7	100.0

APPENDIX F

AVERAGE STANDARDIZED COST PER CHILDWEEK (DOLLAR TABLES)

Table F-1

AVERAGE STANDARDIZED COST PER WEEK
BY SERVICE AREA AND STAFF CATEGORY
FOR 95 PROVIDERS

Aggregate Service Area	Staff Category												TOTAL DOLLARS
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Educational Habilitative	878.22	18.61	22.70	98.20	123.32	452.87	73.61	535.03	1188.32	334.73	11.55	208.59	3115.75
Basic Care	44.54	25.59	9.91	2.93	5.57	120.43	287.55	1226.23	229.09	87.12	1686.91	182.51	4096.40
Administration	1363.20	1.63	4.36	23.19	14.40	51.97	60.05	55.81	81.27	14.43	0	31.76	1702.07
TOTAL DOLLARS	$1485.96	75.83	36.97	114.32	143.29	625.27	421.21	1915.07	1478.68	436.28	1698.46	422.86	8854.22

Note 7899 severely handicapped clients served by these 95 providers

Table P-2

AVERAGE STANDARDIZED COST PER WEEK
BY SERVICE AREA AND STAFF CATEGORY
FOR DAY PROVIDERS

Aggregate Service Area	Staff Category												TOTAL DOLLARS
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Educational Habilitative	$ 55.42	0	3.77	34.43	99.50	197.77	4.60	13.16	1297.62	238.07	0.10	20.84	$1965.28
Basic Care	4.67	3.90	0	0.67	1.33	41.19	13.60	19.17	379.09	98.57	113.62	0.32	676.13
Administration	344.41	0.25	1.13	3.60	9.85	17.75	0.67	0	91.49	26.18	0	1.84	497.17
TOTAL DOLLARS	$404.50	4.15	4.90	38.70	110.68	256.71	18.87	32.33	1768.20	362.82	113.72	23.00	$3138.58

Note: 1629 severely handicapped clients served by these 42 providers

Table F-3

Average Standardized Costs Per Week
by Aggregate Service Area and Staff Category
for Mixed Providers

Aggregate Service Area	Staff Category												TOTAL DOLLARS
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Educational Habilitative	$ 139.53	5.90	7.19	181.89	173.61	[illegible]	115.81	917.69	1470.44	421.45	0	652.33	$ 4732.82
Basic Care	33.40	71.21	0	10.53	1.19	348.19	301.99	3395.74	209.78	69.62	2884.86	338.31	7664.82
Administration	2409.49	2.09	0	84.45	21.44	105.10	102.61	78.89	119.80	8.94	0	32.41	2965.22
TOTAL DOLLARS	$2582.42	79.20	7.19	276.87	196.24	1100.27	520.41	4392.32	1800.02	500.01	2884.86	1023.05	15,362.86

NOTE: 3147 severely handicapped clients served by these 18 providers.

Table P-4

Average Standardized Cost Per Week
by Aggregate Service Area and Staff Category
for Residential Providers

Aggregate Service Area	Staff Category												TOTAL DOLLARS
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Educational Habilitative	$ 76.45	47.66	53.47	100.78	128.18	671.99	137.89	990.33	862.75	411.37	31.24	223.70	$3743.81
Basic Care	98.92	111.49	26.89	2.04	12.90	107.17	617.12	1921.44	54.21	81.56	2856.80	330.73	6221.27
Administration	1986.53	3.11	10.44	17.51	16.56	68.21	112.35	113.18	50.01	2.66	0	68.21	2448.77
TOTAL DOLLARS	2161.90	162.26	90.80	128.33	157.64	847.37	867.36	3024.93	966.97	495.59	2888.04	622.64	12413.85

NOTE: 3123 severly handicapted clients served by these 35 providers.

Table F-3

Average Standardized Cost Per Week
by Aggregate Service Area and Staff Category
for Providers Primarily Serving
Emotionally Disturbed Clients

Aggregate Service Area	Staff Category												TOTAL DOLLARS
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Educational Habilitative	$ 158.09	0.05	106.75	93.04	274.01	523.34	17.11	199.15	917.68	491.23	41.28	410.36	$3188.09
Basic Care	15.81	2.38	34.80	1.51	10.48	270.25	40.61	245.87	32.15	63.90	1057.54	195.97	1971.27
Administration	1081.06	0	21.55	3.89	40.34	117.30	12.76	15.91	62.97	18.14	0	17.50	$1392.22
TOTAL DOLLARS	$1255.76	2.43	163.10	98.44	324.83	910.89	70.48	454.93	1012.80	533.27	1098.82	623.83	$6549.58

NOTE: 1040 severely handicapped clients served by these 19 providers.

Table F-6

Average Standardized Cost Per Week
by Aggregate Service Area and Staff Category
for Providers Primarily Serving Other Than
Emotionally Disturbed Clients

Aggregate Service Area	Staff Category												TOTAL DOLLARS
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Educational Habilitative	$ 58.25	23.26	1.69	87.00	85.65	435.35	87.73	620.51	1230.98	305.61	4.12	158.14	$3098.19
Basic Care	51.72	68.88	3.69	3.30	4.33	82.98	349.38	1593.83	278.34	92.93	1848.09	179.18	4556.54
Administration	1435.02	2.04	0.06	28.02	7.91	35.64	71.88	65.79	85.85	13.50	0	35.33	1781.04
TOTAL DOLLARS	$1544.99	94.18	5.44	118.32	97.89	553.87	508.99	2280.12	1595.17	412.04	1852.21	372.65	$9435.77

Note: 6059 severely handicapped clients served by these 76 providers

APPENDIX C

ANALYSIS OF THE EFFECTS OF REALLOCATION OF EXPENDITURES ON QUALITY

The purpose of this section is to present the model and specific analysis that was employed to examine the effects of reallocation aggregate service area expenditures on the individual quality indices. In the first section below, we will develop a general model for application to the data. It should be emphasized, that certain assumptions were necessary for development of a model. These assumptions are clearly stated at the appropriate points. The second, third, and fourth sections apply the model to the appropriate data sets. Generally, the results indicate that within some provider types, for certain quality indices, limited increases in quality could be obtained by reallocating existing dollars.

Our primary interest is the location of those configurations of administrative, basic care, and educational costs which correspond to maximum scores on the various quality indices. This search for optimality significantly dictates the form of model which should be considered. It is clear, for instance, that the usual linear model

$$Q(a, b, eh) = c_0 + c_1 a + c_2 b + c_3 eh + \varepsilon$$

where:

- Q = quality index
- a = administrative costs per average standardized childweek
- b = basic care costs per average standardized childweek
- eh = costs incurred through programs for educational/rehabilitative standardized childweek
- c_i = constants fit by regression
- ε = error term

is not appropriate. Since c_i does not change with changes in a, the model in Equation 1 can only show quality either increasing or decreasing without bound as a ranges from zero to infinity. This model is undesirable for two reasons:

1. We know that real systems always eventually reach saturation with increasing expenditures.

2. The only conclusion to be drawn from this model would be that spending as much money as possible produces higher quality. This is not the purpose of the analysis contained in this section.

There is an additional reason to distrust the model. One would generally expect that after a few years of experience programs would evolve configurations which at least approximated optimality from their viewpoint. This in turn would force linear regression coefficients to be near zero, with the result that the model would not only fail to identify the current locations of local maxima, but would spuriously imply that changes in cost components were unrelated to quality.

We can correct these deficiencies by introducing quadratic terms so that model 1 becomes

$$Q\ (a, b, eh) = c_0 + c_1 a + c_2 a^2 + c_3 b + c_4 b^2 + c_5 eh + c_6 eh^2 + \varepsilon. \quad \text{(Equation 2)}$$

In this form the response surface has curvature and the partial derivatives

$$\frac{\partial Q}{\partial a}\ ,\ \frac{\partial Q}{\partial b}\ ,\ \frac{\partial Q}{\partial eh}$$

all exist and are non-trivial functions of a, b, and eh respectively. Optimal points may now be located by traditional maximization methods.*

One further refinement of Equation 6.2 is appropriate. Another way of describing the difference between Equation 6.1 and Equation 6.2 is to note that in Equation 6.2 the coefficients of a, b, and eh are no longer constants, but are linear functions of their respective variables; that is, if $\mathcal{L}$ is a linear function, $\mathcal{L}(x) = \alpha x + \beta$, then

$$\mathcal{L}(x) \cdot x = \alpha x^2 + \beta x.$$

We have argued that it is reasonable to expect the coefficient of a to vary with differing levels of a. It is equally reasonable to expect the coefficient to be different at different levels of b. We can generalize the coefficients still further by making them linear functions not just of their own variable, but of all three:

$$\mathcal{L}(a, b, eh) = \alpha + \beta_1 a + \beta_1 b + \beta_3 eh$$

so that

$$\mathcal{L}(a, b, eh) \cdot a = \alpha a + \beta_1 a^2 + \beta_2 ab + \beta_3 a \cdot eh.$$

Substituting this general coefficient in model (1) leads us to

$$Q(a, b, eh) = c_0 + c_1 a + c_2 b + c_3 eh + c_4 a^2 + c_5 b^2 + c_6 eh^2 + c_7 a \cdot b + c_8 a \cdot eh + c_9 b \cdot eh + \varepsilon. \quad \text{(Equation 3)}$$

---

*For a discussion of these techniques consult any advanced calculus textbook such as Kaplan, Wilfred, Advanced Calculus, Addison-Wesley, 1952, Chapter 2.

Since model 3 is designed for use with regression analysis, its validity as a description of our data may be tested by the ordinary statistics of regression: R^2 and F. In Table G-1 we present these statistics for each of the 18 quality indices for day providers. In four of these cases the adjusted R^2 exceeds .20, indicating that the cost information is sufficient to account for at least 20% of the variance among providers. These four are:

1. Range of Educational/habilitative Materials
5. Instructive Staff Behavior
6. Parent Involvement with the Provider
8. Respect for Clients

Table G-2 shows the regression models for these indicators of quality.

Tables G-3 through G-5 show the values of the respect for clients index at various levels of administrative, basic care, and educational/habilitative expenditures. Among programs with low administrative expenditures (the first column of Table G-4), the quality index peaks at a moderate level of educational/habilitative expenditures. At higher levels of administrative expenditures the level of respect for clients appears generally lower, and there is no longer a clear relationship between respect for clients and either educational/habilitative expenditures or basic care expenditures.

Another way to examine the interrelationship of all three cost variables simultaneously with respect for clients is to calculate the partial derivatives of the quality function with respect to the cost variables:

$$\frac{\partial Q_8}{\partial a} = -2.26 + .24eh - .03b + 3.68a \qquad \text{(Equation 4)}$$

$$\frac{\partial Q_8}{\partial eh} = .24 - 1.05eh + 1.28b - .03a \qquad \text{(Equation 5)}$$

$$\frac{\partial Q_8}{\partial eh} = 1.44 - 2.16eh - 1.05b + .24a \qquad \text{(Equation 6)}$$

Table 6-12

REGRESSION MODELS FOR DAY PROVIDERS

Quality Index	R^2	Adjusted R^2	F(b)	p
1. Range of Educational Materials	.49	.33	2.93	.025
2. % Staff Time on Educational	.26	.02	1.08	
3. Amount of Client Time on Educational Task	.08	0	0.25	
4. Warm Staff-Client Interactions	.27	.02	1.08	
5. Instructive Staff Behavior	.51	.35	3.13	.010
6. Parent Involvement in Provider	.40	.20	2.03	.10
7. Parent Involvement with Child	.35	.14	1.64	
8. Respect for Clients	.54	.38	3.51	.005
9. Privacy	.12	0	0.41	
10. Non-Institutional Environment	.29	.05	1.22	
11. Personal Possessions (a)	----	----	----	
12. Physical Comfort	.12	0	0.41	
13. Evidence of Client Assessment	.16	0	0.55	
14. Evidence of Program Evaluation	.21	0	0.79	
15. Staff Development Opportunities	.14	0	0.50	
16. Evidence of Client Functional Level Improvement	.24	0	0.96	
17. Movement to less Sheltered Structure	.38	.18	1.86	.10
18. Evidence that Clients Receive Educational/Habilitative Services	.33	.11	1.50	

(a) All day providers received the same quality rating for personal possessions.

(b) Degrees of freedom: regression = 9, residual = 27; 37 cases are used in the analysis.

Table G-2

STANDARDIZED REGRESSION COEFFICIENTS
FOR QUALITY-COST MODEL

Model Component	Range of Educational/ Habilitative Materials	Instructive Staff Behavior	Parent Involvement with Provider	Respect for Clients
Educational/Habilitative Expenditures	-.76	-1.89	2.48*	1.44
Basic Care Expenditures	-.04	- .55	.56	.24
Administration Expenditures	.45	1.11	-1.39	-2.26*
EH x B	-.62	1.70*	-1.62*	-1.05*
EH x A	.64	.56	- .54	.24
B x A	.13	.07	.22	- .03
$(EH)^2$	.95	.80	-1.56	-1.08
B^2	.20	- .47	.06	.64
A^2	-1.27*	-1.26*	1.20	1.84*

* indicates coefficients significant at the .05 level or better.

Table G-3

MEAN AND FREQUENCY FOR QUALITY OF RESPECT FOR CLIENTS INDEX BY BASIC CARE AND ADMINISTRATIVE COSTS PER AVERAGE STANDARDIZED CHILDWEEK: DAY PROVIDERS*

Basic Care Costs Per Average Standardized Childweek	Administrative Costs per Average Standardized Childweek				
	Under $10	$10 to $20	$20 to $30	Over $30	Overall Mean
Under $1.50	.85	.30	.60	.60	.53
	(7)	(4)	(2)	(4)	(17)
$1.50 to $2.50	.40	.00	---	---	.24
	(3)	(2)	---	---	(5)
$2.50 to $3.50	1.20	.00	---	---	.60
	(2)	(2)	---	---	(4)
Over $3.50	.87	.80	.00	.00	.75
	(11)	(3)	(1)	(1)	(16)
Overall Mean	.83	.32	.40	.48	.62
	(23)	(11)	(3)	(5)	(42)

* Cell entries are means. Numbers in parentheses are frequencies. A discussion of the index and its rating categories can be found on page 30. The points for this analysis were:

0.0=Low: presence of all of the negative behaviors.
1.2=High: absence of all the negative behaviors.

Table G-4

MEAN AND FREQUENCY FOR QUALITY OF RESPECT FOR CLIENTS INDEX BY EDUCATIONAL/HABILITATIVE AND ADMINISTRATIVE COSTS PER AVERAGE STANDARDIZED CHILDWEEK: DAY PROVIDERS*

Educational/Rehabilitative Costs Per Average Standardized Childweek	Administrative Costs per Average Standardized Childweek				
	Under $10	$10 to $20	$20 to $30	Over $30	Overall Mean
$0 to $20	.72	.40	---	---	.60
	(5)	(3)	---	---	(8)
$20 to $20	1.05	.00	.00	.00	.60
	(8)	(4)	(1)	(1)	(14)
$40 to $60	.90	.60	.00	.60	.65
	(4)	(4)	(1)	(2)	(11)
Over $60	.60	---	1.20	.60	.66
	(6)	---	(1)	(2)	(9)
Overall Mean	.83	.32	.40	.48	.62
	(23)	(11)	(3)	(5)	(42)

* Cell entries are means. Numbers in parentheses are frequencies. A discussion of the index and its rating categories can be found on page 30. The points for this analysis were:

0.0=Low: presence of all of the negative behaviors.
1.2=High: absence of all the negative behaviors.

Table G-5

MEAN AND FREQUENCY FOR QUALITY OF RESPECT FOR CLIENTS INDEX BY BASIC CARE AND EDUCATIONAL/HABILITATIVE COSTS PER AVERAGE STANDARDIZED CHILDWEEK: DAY PROVIDERS*

Educational/Habilitative Costs Per Average Standardized Childweek	Basic Care Costs Per Average Standardized Childweek				
	Under $1.00	$1.50 to $2.00	$2.50 to $3.00	Over $3.50	Overall Mean
$ 0 to $20	.40	.00	---	.90	.60
	(3)	(1)	---	(4)	(8)
$20 to $40	.68	---	.40	.60	.60
	(7)	---	(3)	(4)	(14)
$40 to $60	.48	.00	1.20	1.20	.65
	(5)	(2)	(1)	(3)	(11)
Over $60	1.20	.60	---	.48	.66
	(2)	(2)	---	(5)	(9)
Overall Mean	.63	.24	.60	.75	.62
	(17)	(5)	(4)	(16)	(42)

* Cell entries are means. Numbers in parentheses are frequencies. A discussion of the index and its rating categories can be found on page 30. The points for this analysis were:

0.0=Low: presence of all of the negative behaviors.
1.2=High: absence of all the negative behaviors.

The functions Equation 4 through Equation 6 correspond exactly to the generalized coefficients we introduced in model Equation 3. By examining them one at a time we can see exactly how the dependency of quality index on one cost varies through the range of providers. From Equation 4 we conclude a generally negative relationship between expenditures on administration and the degree of respect with which clients appear to be treated. The positive coefficient of a, however, indicates that this negative relationship reaches saturation after an increase in administrative costs. The comparatively small coefficients of b and eh indicate that this relationship between administrative expenditures and respect for clients is relatively non-interactive with either basic care expenditure levels or expenditures for educational habilitation.

Equations 5 and 6 state a generally positive relationship between basic care expenditures and educational/habilitative, respectively, and respect for clients. There is a significant negative interaction of eh x b on respect. ($F = 5.06$, with 1 and 27 d.f. $p < .05$.) The negative interaction in equations with positive main effects indicates a non-additivity imposed by a ceiling effect. Once either of the care variables has raised the quality variable, the other is unable to have additional effect. This limitation may be partly an artifact of the restriction of the quality measures to only a limited range. In any event, respect for clients increases as either of the two cost components is increased, leveling off at a maximum in the case of educational/habilitative expenditures and increasing over the the entire range of basic care expenditures.

Equations 4, 5, and 6 provide one final piece of information about the relationship of the quality indices to cost components. From calculus, it is easy to show that if the quality function has a maximum within some region, that maximum must either lie on the boundary of the region or at the combination of a, b, eh that satisfies

$$\frac{\partial Q}{\partial a} = \frac{\partial Q}{\partial b} = \frac{\partial Q}{\partial eh} = 0. \qquad \text{(Equation 7)}$$

---

*In the following discussion, all coefficients are computed in the metric of standard scores.

In this case the feasible region is given by

$$a \geq 0, \quad b \geq 0, \quad eh \geq 0.$$

$$a + b + eh \leq \text{total expenditures for a given provider}$$

A straightforward FORTRAN computer program can search for the maximal points using these equations. The results of these computations were consistent with our somewhat more intuitive analysis of the partial derivatives:

(1) At all budget levels the optimal configuration includes minimal administrative costs.

(2) Because $\frac{\partial Q}{\partial b}$ increases throughout the range of b, the optimal point lies at the extreme greatest expenditure

(3) The level of respect is not very sensitive to trade-offs between expenditures for basic care and educational/habilitative services, confirming the ceiling effect noted earlier. The predicted optimal quality levels at

$$a = 0, \quad b = \$14, \quad eh = \$46 \quad \text{and}$$
$$a = 0, \quad b = \$60, \quad eh = 0$$

differ by less than one percent.

(4) The optimization provides one additional bit of reassuring information not yielded by any of the other analytic methods. As the feasible region expands (by increasing the budget constraint), the predicted value at the maximum also increases. At mean budget levels of approximately \$70, a 10% increase in budget is accompanied by a slightly greater than 10% increase in the quality indices.

Similar analyses may be conducted for the remaining variables for which significant cost dependence has been found. Tables G-6 through G-8 show the ratings for instructive staff behavior, which depends in a rather complex way on the cost components. F-tests of the regression model point to the interaction between educational/habilitative and basic care as the single most significant predictor ($F=12.53$ with 1,27 d.f.; $p=.002$). There is unidimensional dependence on educational/habilitative

expenditures (linear) and administration expenditures (non-linear). The partial derivatives provide some further quantification of this dependence:

$$\frac{\partial Q_5}{\partial a} = 1.11 - 2.54a + .07b + .56eh$$

$$\frac{\partial Q_5}{\partial b} = -.55 + .07a - .47b + 1.70eh$$

$$\frac{\partial Q_5}{\partial eh} = -1.89 + .56a + 1.70b + 1.60eh$$

The components of the quadratic terms show the existence of saturation levels with respect to administrative and basic care costs, but, reasonably enough, a continually increasing level of instructive staff behavior as the amount spent on educational/habilitative programs increases.

When optimization is performed on this function the constrained maximum is found to lie at a point where administrative costs are about twice as high as the average over all day providers ($30 as compared to an average of $16.25) and other costs are minimized. The predicted quality level at this point is 80% higher than that at the average values of expenditures. As was the case with the previous quality measure, respect for clients, here also the level of the quality index remains relatively stable over a considerable range of at least some of the expenditure components. A mathematical saddle point exists where

$$a = \$36 \ , \ b = \$1.60, \ eh = \$25$$

which results in a predicted quality level which is still nearly 50% higher than that at average expenditure levels. Because of the arbitrary scaling of the quality indices, percentage comparisons should be viewed only as generally indicative of the slope of the response surface in these areas, and not as an actual numerical ratio to be found under experimental or operational conditions. Finally, according to our optimization model the value of the maximum is not influenced by the size of the total budget constraint, but only by the way cost items are apportioned within that budget.

The range of educational materials, Tables G-9 through G-11, show less variance than any of the other indices here discussed. Only three of the day providers scored less than the maximum on this scale.

Table G-6

MEAN AND FREQUENCY FOR QUALITY OF INSTRUCTIVE STAFF BEHAVIOR INDEX BY BASIC CARE AND EDUCATIONAL/HABILITATIVE COSTS PER AVERAGE STANDARDIZED CHILDWEEK: DAY PROVIDERS *

Educational/Habilitative Costs Per Average Standardized Childweek	Basic Care Costs Per Average Standardized Childweek				
	Under $1.00	$1.50 to $2.00	$2.50 to $3.00	Over $3.50	Overall Mean
$0 to $20	.33	.00	---	.25	.25
	(3)	(1)	---	(4)	(8)
$20 to $40	.14	---	.00	.00	.07
	(7)	---	(3)	(4)	(14)
$40 to $60	.20	.50	.00	.33	.27
	(5)	(2)	(1)	(3)	(11)
Over $60	.00	.00	---	1.00	.55
	(2)	(2)	---	(5)	(9)
Overall Mean	.17	.20	.00	.43	.26
	(17)	(5)	(4)	(16)	(42)

* Cell entries are means. Numbers in parentheses are frequencies. A discussion of the index and its rating categories can be found on page 29. The points for this analysis were:

0.0=Low: all three behaviors are absent or are present an average of less than once per observation series.

1.0=Medium: the three behaviors are present at least once but less than twice per observation series.

2.0=High: the three behaviors are present an average of at least twice per observation series.

Table G-7

MEAN AND FREQUENCY FOR QUALITY OF INSTRUCTIVE STAFF BEHAVIOR INDEX BY EDUCATIONAL/HABILITATIVE AND ADMINISTRATIVE COSTS PER AVERAGE STANDARDIZED CHILDWEEK: DAY PROVIDERS*

Educational/Habilitative Costs Per Average Standardized Childweek	Administrative Costs Per Average Standardized Childweek				
	Under $10	$10 to $20	$20 to $30	Over $30	Overall Mean
$0 to $20	.00	.66	---	---	.25
	(5)	(3)	---	---	(8)
$20 to $40	.00	.00	.00	1.00	.07
	(8)	(4)	(1)	(1)	(14)
$40 to $60	.25	.50	.00	.00	.27
	(4)	(4)	(1)	(2)	(11)
Over $60	.50	---	.00	1.00	.55
	(6)	---	(1)	(2)	(9)
Overall Mean	.17	.36	.00	.60	.26
	(23)	(11)	(3)	(5)	(42)

* Cell entries are means. Numbers in parentheses are frequencies. A discussion of the index and its rating categories can be found on page 29. The points for this analysis were:

0.0=Low: all three behaviors are absent or are present an average of less than once per observation series.

1.0=Medium: the three behaviors are present at least once but less than twice per observation series.

2.0=High: the three behaviors are present an average of at least twice per observation series.

Table G-8

MEAN AND FREQUENCY FOR QUALITY OF INSTRUCTIVE STAFF BEHAVIOR INDEX BY BASIC CARE AND ADMINISTRATIVE COSTS PER AVERAGE STANDARDIZED CHILDWEEK: DAY PROVIDER *

Basic Care Costs Per Average Standardized Childweek	Administrative Costs Per Average Standardized Childweek				
	Under $10	$10 to $20	$20 to $30	Over $30	Overall Mean
Under $1.50	.00	.50	.00	.25	.17
	(7)	(4)	(2)	(4)	(17)
$1.50 to $2.50	.00	.50	---	---	.20
	(3)	(2)	---	---	(5)
$2.50 to $3.50	.00	.00	---	---	.00
	(2)	(2)	---	---	(4)
Over $3.50	.36	.33	.00	2.00	.43
	(11)	(3)	(1)	(1)	(16)
Overall Mean	.17	.36	.00	.60	.26
	(23)	(11)	(3)	(5)	(42)

* Cell entries are means. Numbers in parentheses are frequencies. A discussion of the index and its rating categories can be found on page 29. The points for this analysis were:

0.0=Low: all three behaviors are absent or are present an average of less than once per observation series.

1.0=Medium: the three behaviors are present at least once but less than twice per observation series.

2.0=High: the three behaviors are present an average of at least twice per observation series.

All three were at relatively extreme budgetary configurations: one spent over $30 for administration (as did only four other providers); the other two spent only average or small amounts on administration but were among the highest spenders on educational/habilitative programs. These latter two were also among the most costly in providing basic care. Given the insensitivity of this variable over most of the range of cost configurations, the only conclusion to be drawn from the models is that high levels of expenditure not only seem unnecessary for this variable, but may indicate the presence of other characteristics causing the lower ratings on the index.

The level of parent involvement in providers is related to budget configurations, but the dependence is not generally a causal one. A number of providers utilize volunteer or nominally paid parent help as a substitute for programmatic expenditures. Thus we find, in Tables 6-23 to 6-25, that parent involvement is highest in those programs with comparatively modest expenditures for all budget areas. Parent involvement is at its highest in those programs at the lowest levels of administrative cost (under $10) and at or just below the median of basic care costs and educational/habilitative costs.

The regression model provides further confirmation of the notion of parents as a substitute for expenditure. The single strongest contributor to the regression equation is the interaction of educational/habilitative costs and basic care costs. Its coefficient is large, significant, and negative, indicating that when the two increase together (as in high budget providers), parent involvement drops most rapidly.

Table G-9

MEAN AND FREQUENCY FOR QUALITY OF RANGE OF EDUCATIONAL MATERIALS INDEX BY BASIC CARE AND EDUCATIONAL/HABILITATIVE COSTS PER AVERAGE STANDARDIZED CHILDWEEK: DAY PROVIDERS *

Educational/Habilitative Costs Per Average Standardized Childweek	Basic Care Costs Per Average Standardized Childweek				
	Under $1.00	$1.50 to $2.00	$2.50 to $3.00	Over $3.50	Overall Mean
$ 0 to $20	2.00	2.00	---	2.00	2.00
	(3)	(1)	---	(4)	(8)
$20 to $40	2.00	---	2.00	2.00	2.00
	(7)	---	(3)	(4)	(14)
$40 to $60	1.83	2.00	2.00	2.00	1.91
	(6)	(2)	(1)	(3)	(12)
Over $60	2.00	2.00	---	1.60	1.77
	(2)	(2)	---	(5)	(9)
Overall Mean	1.94	2.00	2.00	1.87	1.93
	(18)	(5)	(4)	(16)	(43)

* Cell entries are means. Numbers in parentheses are frequencies. A discussion of the index and its rating categories can be found on page 27. The points for this analysis were:

0.0=Low: few materials are available.

1.0=Medium: a range of different materials are available; they are at least in fair condition and of moderate quality; only available sometimes to clients.

2.0=High: a wide range of materials which are in at least good condition, of high quality, and are always accessible to severely handicapped clients.

Table G-10

MEAN AND FREQUENCY FOR QUALITY OF RANGE OF EDUCATIONAL MATERIALS BY EDUCATIONAL/HABILITATIVE AND ADMINISTRATIVE COSTS PER AVERAGE STANDARDIZED CHILDWEEK: DAY PROVIDER*

Educational/Habilitative Costs Per Average Standardized Childweek	Administrative Costs Per Average Standardized Childweek				
	Under $10	$10 to $20	$20 to $30	Over $30	Overall Mean
$ 0 to $20	2.00	2.00	---	---	2.00
	(5)	(3)	---	---	(8)
$20 to $40	2.00	2.00	2.00	2.00	2.00
	(8)	(4)	(1)	(1)	(14)
$40 to $60	2.00	2.00	2.00	1.50	1.91
	(4)	(4)	(2)	(2)	(12)
Over $60	1.66	---	2.00	2.00	1.77
	(6)	---	(1)	(2)	(9)
Overall Mean	1.91	2.00	2.00	1.80	1.93
	(23)	(11)	(4)	(5)	(43)

* Cell entries are means. Numbers in parentheses are frequencies. A discussion of the index and its rating categories can be found on page 27. The points for this analysis were:

0.0=Low: few materials are available.

1.0=Medium: a range of different materials are available; they are at least in fair condition and of moderate quality; only available sometimes to clients.

2.0=High: a wide range of materials which are in at least good condition, of high quality, and are always accessible to severely handicapped clients.

Table G-11

MEAN AND FREQUENCY FOR QUALITY OF RANGE OF EDUCATIONAL MATERIALS INDEX BY BASIC CARE AND ADMINISTRATIVE COSTS PER AVERAGE STANDARDIZED CHILDWEEK: DAY PROVIDERS *

Basic Care Costs Per Average Standardized Childweek	Administrative Costs Per Average Standardized Childweek				
	Under $10	$10 to $20	$20 to $30	Over $30	Overall Mean
Under $1.50	2.00	2.00	2.00	1.75	1.94
	(7)	(4)	(3)	(4)	(18)
$1.50 to $2.50	2.00	2.00	---	---	2.00
	(3)	(2)	---	---	(5)
$2.50 to $3.50	2.00	2.00	---	---	2.00
	(2)	(2)	---	---	(4)
Over $3.50	1.81	2.00	2.00	2.00	1.87
	(11)	(3)	(1)	(1)	(16)
Overall Mean	1.91	2.00	2.00	1.80	1.93
	(23)	(11)	(4)	(5)	(43)

* Cell entries are means. Numbers in parentheses are frequencies. A discussion of the index and its rating categories can be found on page 27. The points for this analysis were:

0.0=Low: few materials are available.

1.0=Medium: a range of different materials are available; they are at least in fair condition and of moderate quality; only available sometimes to clients.

2.0=High: a wide range of materials which are in at least good condition, of high quality, and are always accessible to severely handicapped clients.

Table G-12

MEAN AND FREQUENCY FOR QUALITY OF PARENT INVOLVEMENT IN PROVIDER INDEX BY EDUCATIONAL/HABILITATIVE AND BASIC CARE COSTS PER AVERAGE STANDARDIZED CHILDWEEK: DAY PROVIDER*

Educational/Rehabilitative Costs Per Average Standardized Childweek	Basic Care Costs Per Average Standardized Childweek				
	Under $1.00	$1.50 to $2.50	$2.50 to $3.00	Over $3.50	Overall Mean
$ 0 to $20	2.00	4.00	---	2.50	2.50
	(3)	(1)	---	(4)	(4)
$20 to $40	2.57	---	2.66	3.00	3.00
	(7)	---	(3)	(4)	(4)
$40 to $60	1.66	4.00	4.00	2.66	2.66
	(6)	(2)	(1)	(3)	(3)
Over $60	3.00	3.00	---	1.20	1.20
	(2)	(2)	---	(5)	(5)
Overall Mean	2.22	3.60	3.00	2.25	2.25
	(18)	(5)	(4)	(16)	(16)

* Cell entries are means. Numbers in parentheses are frequencies. A discussion of the index and its rating categories can be found on page 29. The points for this analysis were:

0.0=Low: no parent involvement.

2.0=Medium: parent involvement in at least one activity.

4.0=High: more than 25% of the parents are involved in at least 3 activities.

Table G-13

MEAN AND FREQUENCY FOR QUALITY OF PARENT INVOLVEMENT IN PROVIDER INDEX BY ADMINISTRATIVE AND EDUCATIONAL/HABILITATIVE COSTS PER AVERAGE STANDARDIZED CHILDWEEK: DAY PROVIDERS*

Educational/Habilitative Costs Per Average Standardized Childweek	Administrative Costs Per Average Standardized Childweek				
	Under $10	$10 to $20	$20 to $30	Over $30	Overall Mean
$ 0 to $20	2.80	2.00	---	---	2.50
	(5)	(3)	---	---	(8)
$20 to $40	3.00	2.50	2.00	2.00	2.71
	(8)	(4)	(1)	(1)	(14)
$40 to $60	3.00	3.00	1.00	2.00	2.50
	(4)	(4)	(2)	(2)	(12)
Over $60	2.00	---	4.00	1.00	2.00
	(6)	---	(1)	(2)	(9)
Overall Mean	2.69	2.54	2.00	1.60	2.46
	(23)	(11)	(4)	(5)	(43)

* Cell entries are means. Numbers in parentheses are frequencies. A discussion of the index and its rating categories can be found on page 29. The points for this analysis were:

0.0=Low: no parent involvement.

2.0=Medium: parent involvement in at least one activity.

4.0=High: more than 25% of the parents are involved in at least 3 activities.

Table G-14

MEAN AND FREQUENCY FOR QUALITY OF PARENT INVOLVEMENT IN PROVIDER INDEX BY BASIC CARE AND ADMINISTRATIVE COSTS PER AVERAGE STANDARDIZED CHILDWEEK: DAY PROVIDERS*

Basic Care Costs Per Average Standardized Childweek	Administrative Costs Per Average Standardized Childweek				
	Under $10	$10 to $20	$20 to $30	Over $30	Overall Mean
Under $1.50	2.57	2.00	2.00	2.00	2.22
	(7)	(4)	(3)	(4)	(18)
$1.50 to $2.50	3.33	4.00	---	---	3.60
	(3)	(2)	---	---	(5)
$2.50 to $3.50	3.00	3.00	---	---	3.00
	(2)	(2)	---	---	(4)
Over $3.50	2.54	2.00	2.00	.00	2.25
	(11)	(3)	(1)	(1)	(16)
Overall Mean	2.69	2.54	2.00	1.60	2.46
	(23)	(11)	(4)	(5)	(43)

* Cell entries are means. Numbers in parentheses are frequencies. A discussion of the index and its rating categories can be found on page 29. The points for this analysis were:

0.0=Low: no parent involvement.

2.0=Medium: parent involvement in at least one activity.

4.0=High: more than 25% of the parents are involved in at least 3 activities.

APPENDIX H

AVERAGE STANDARDIZED COST
PER CHILDWEEK BY
AGGREGATE SERVICE AREA
AND STAFF CATEGORY
NORMALIZED TO 100%

Table H-1

AVERAGE STANDARDIZED COST PER CHILDWEEK BY AGGREGATE SERVICE AREA AND STAFF CATEGORY FOR PROVIDERS PRIMARILY SERVING EMOTIONALLY DISTURBED CLIENTS: NORMALIZED TO 100%

Aggregate Service Area	Staff Category												TOTAL DOLLARS
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Educational/ Habilitative	1.8	0	7.4	0.9	2.8	12.04	0.2	2.8	10.2	5.7	0.3	4.3	48.9
Basic Care	0.2	0.02	2.4	0.01	0.08	4.1	0.7	3.4	0.6	1.9	10.3	1.8	25.9
Administration	18.5	0	1.2	0.05	0.6	2.6	0.2	0.1	1.2	0.2	0	0.2	25.2
TOTAL DOLLARS	20.5	0.02	11.1	0.9	3.5	18.8	1.2	6.4	12.1	7.9	10.7	6.4	100%

Note: 1040 severely handicapped clients served by these 19 providers.

H-1

Table H-2

AVERAGE STANDARDIZED COST PER CHILDWEEK BY AGGREGATE SERVICE AREA AND STAFF CATEGORY FOR RESIDENTIAL PROVIDERS: NORMALIZED TO 100%

Aggregate Service Area	Staff Category												TOTAL DOLLARS
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Educational/ Habilitative	0.004	0.06	3.4	3.3	1.1	6.7	0.7	6.2	18.1	3.3	0.6	2.7	46.9
Basic Care	2.5	0.5	1.2	0.04	0.04	1.2	4.1	13.8	2.01	1.5	12.2	1.4	40.8
Administration	8.8	0.004	0.5	0.1	0.1	0.5	0.4	0.3	0.4	0.02	0	0.9	12.3
TOTAL DOLLARS	11.8	0.5	5.2	3.5	1.3	8.4	5.2	20.3	20.5	4.9	12.8	5.1	100%

Note: 3123 severely handicapped clients served by these 35 providers.

Table H-3

AVERAGE STANDARDIZED COST PER CHILDWEEK BY AGGREGATE SERVICE AREA AND STAFF CATEGORY FOR MIXED PROVIDERS: NORMALIZED TO 100%

Aggregate Service Area	Staff Category												TOTAL DOLLARS
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Educational/ Habilitative	0.07	0.01	0.09	0.5	1.5	3.6	0.3	6.9	15.1	4.2	0	4.9	38.4
Basic Care	0.1	0.1	0	0.02	0	2.9	1.1	13.2	1.1	0.6	17.9	2.3	39.5
Administration	18.6	0.007	0	0.2	0.2	1.1	0.3	0.3	1.3	0.02	0	0.09	22.1
TOTAL DOLLARS	19.4	0.1	0.09	0.8	1.8	7.6	1.7	20.4	17.6	4.8	17.9	7.4	100%

Note: 3147 severely handicapped clients served by these 18 providers.

H-3

Table H-4

AVERAGE STANDARDIZED COST PER CHILDWEEK BY
AGGREGATE SERVICE AREA AND STAFF CATEGORY FOR
95 PROVIDERS: NORMALIZED TO 100%

Aggregate Service Area	Staff Category												TOTAL DOLLARS
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Educational/ Habilitative	0.9	0.04	1.9	2.3	1.6	6.6	0.5	4.7	21.9	5.3	0.3	2.6	49.2
Basic Care	0.7	0.31	0.66	0.03	0.03	1.3	2.6	10.1	3.4	1.8	11.2	1.2	33.8
Administration	13.3	0.01	0.3	0.1	0.2	0.7	0.2	0.2	0.9	0.2	0	0.5	17.0
TOTAL DOLLARS	14.9	0.3	2.9	2.5	1.9	8.8	3.3	15.1	26.3	7.4	11.6	4.4	100%

Note: 7899 severely handicapped clients served by these 95 providers.

Table H-5

AVERAGE STANDARDIZED COST PER CHILDWEEK BY AGGREGATE SERVICE AREA AND STAFF CATEGORY FOR DAY PROVIDERS: NORMALIZED TO 100%

Aggregate Service Area	Staff Category												TOTAL DOLLARS
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Educational/ Habilitative	1.0	0	0.1	1.4	2.6	8.7	0.1	0.1	34.3	10.3	0	1.01	61.1
Basic Care	0.2	0.07	0	0.01	0.02	0.6	0.3	0.2	8.0	3.5	2.9	0.01	16.2
Administration	18.1	0.05	0.2	0.1	0.4	1.2	0.01	0	1.9	0.7	0	0.05	22.7
TOTAL DOLLARS	20.2	0.1	0.2	1.6	3.1	10.5	0.5	0.4	44.3	14.5	2.9	1.1	100%

Note: 1629 severely handicapped clients served by these 42 providers.

Table H-6

AVERAGE STANDARDIZED COST PER CHILDWEEK BY
AGGREGATE SERVICE AREA AND STAFF CATEGORY FOR
PROVIDERS PRIMARILY SERVING OTHER THAN EMOTIONALLY
DISTURBED CLIENTS: NORMALIZED TO 100%

Aggregate Service Area	Staff Category												TOTAL DOLLARS
	Administrators	Medical Doctors	Psychiatrists	Psychologists	Social Workers	Therapists	Nurses	Attendants	Certified Teachers	Teacher Aides	Support Staff	Other Staff	
Educational/ Habilitative	0.5	0.05	0.2	2.8	1.1	4.8	0.5	5.3	25.5	5.2	0.3	2.1	48.7
Basic Care	1.8	0.4	0.05	0.03	0.02	0.5	3.2	12.2	4.3	1.8	11.4	1.0	37.01
Administration	11.3	0.02	0.007	0.1	0.1	0.1	0.2	0.2	0.9	0.2	0	0.6	14.2
TOTAL DOLLARS	13.8	0.4	0.2	3.02	1.3	5.5	4.0	17.8	30.8	7.2	11.7	3.7	100%

Note: 6859 severely handicapped clients served by these 76 providers.